CTE
2003-2004
Administrative
Planning Guide

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Commonwealth of Virginia
Department of Education
Office of Career and Technical Education Services
Richmond, Virginia 23218-2120

Developed by
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Foreword

The *CTE Administrative Planning Guide* includes information to help administrators plan and schedule instructional programs and make the best use of instructional resources. In contrast to previous editions of the Program Planning Guide, this document is organized around courses, course sequences, and graduation requirements rather than the offerings of specific program areas.

The guide contains the following information:
- Courses and course descriptions
- Approved course sequences that fulfill the requirement for two sequential electives and prepare students for career entry and continuing education
- Graduation information—seals and student-selected verified credits
- Certification, licensure, and occupational competency assessment overviews and requirements
- A directory of Virginia Department of Education staff who can help with instructional planning

Local administrators, teachers, and counselors who have the responsibility for students' course schedules should find Sections 2 (course descriptions), 3 (course sequences), and 4 (certification/license/assessment overviews) particularly helpful. The remainder of the information should be a benefit to administrators in planning instructional offerings.
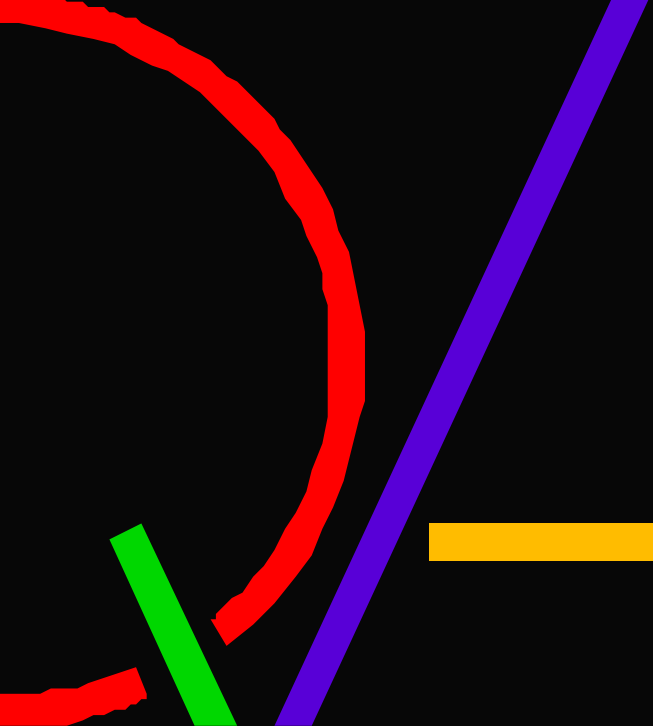
Revisions to this edition of the *CTE Administrative Planning Guide* include descriptions and sequences for several new courses, updated certification information, and corrected information related to verified credit, the Advanced Mathematics and Technology seal, and the Career and Technical Education seal.

Please use the directory in Section 11 to contact us with comments, concerns, and suggestions as well as questions concerning the content of the guide. We look forward to your suggestions for improvement.

Robert A. Almond, Director
Office of Career and Technical Education Services
Virginia Department of Education

Contents of the Guide

Section 1: Introduction

Section 1 introduces the *Administrative Planning Guide* and presents a variety of terms and definitions useful in scheduling CTE courses for students.

If you are interested in a single program area, you will find a chart beginning on page 4 that cross-references by page number each course in a program area to its description, approved sequences, and certification/license/assessment information. For example, you can find all the courses in Agricultural Education and determine where to find the information you need about each course.

Section 1: Introduction

The CTE Administrative Planning Guide is designed to assist counselors, teachers, and administrators who schedule student enrollment in elective CTE courses. This guide presents clear and concise information about courses, course descriptions, course sequences, and certifications/licenses in easy-to-find alphabetical lists.

Program Content Areas
For readers who are interested in a single program content area, a chart appears at the end of the introduction (beginning on page 1-4) that cross-references by page number each course in an area to its description, approved sequences, and certification information.

About the Vocabulary
This edition of the *Administrative Planning Guide* uses terms that are defined or explained as follows.

Two Sequential Electives

> Students who are pursuing the Standard Diploma or the new Modified Standard Diploma must complete two sequential electives. *Two sequential electives* comprise a concentration of courses from a variety of options, including Career and Technical Education. Completing any CTE concentration or specialization, including prerequisites, if applicable, will meet the requirement.

Concentration and Specialization Sequences

> A *concentration* is a coherent sequence of courses completed by a student in a specific career area as identified in this planning guide (Section 3).

> A *specialization* is a choice by a student to specialize in an occupational field by taking additional courses in a specific career area as identified in this planning guide.

> A career and technical education *completer* is a student who has met the requirements for a career and technical concentration or specialization and all requirements for high school graduation or an approved alternative education program.

Student-Selected Verified Credit

> A *standard credit* is based on a minimum of 140 clock hours of instruction and successful completion of the requirements of the course.

> A *verified credit* is based on a standard credit plus a passing score on the end-of-course SOL test (or other test as described in the Standards of Accreditation 8 VAC 20-131-110). A standard credit may not be verified more than once.

> A *student-selected verified credit* is a credit for a course that includes a test approved by the Virginia Board of Education. (According to SOA 8 VAC 20-131-110.B, footnote 5: A student may utilize additional tests for earning verified credit in computer science, technology, or other areas as prescribed by the Board in 8 VAC 20-131-110.B.)

> On May 28, 2003, the Board of Education approved selected occupational competency assessments from the National Occupational Competency Testing Institute (NOCTI) for use in awarding student-selected verified credit in approved career and technical education courses or course sequences.

Criteria for Certification or Licensure
Student-selected verified credit will be awarded for certification or licensure examinations that meet all of the following criteria:
- Industry certification or licensure examinations that are approved to satisfy the requirements for the Board of Education's Career and Technical Education Seal and the Board of Education's Seal of Advanced Mathematics and Technology will satisfy requirements for student-selected verified credits.

For students to be eligible to receive student-selected verified credits, their teacher and/or the career and technical education program must be certified by the issuing organization relative to the industry certification or licensure. In the case of a CTE program area where there are potential multiple certifications, the teacher must be certified in at least one industry certification that is related to the course and/or course sequence. There is no teacher certification requirement by NOCTI (National Occupational Competency Testing Institute) for students to receive verified credits upon passing a selected NOCTI assessment related to their CTE program.

- A standard credit may not be verified more than once.

Earning Student-Selected Verified Credit

One student-selected verified credit will be awarded for passing each certification or licensure examination or occupational competency assessment that meets all of the above criteria if the student earns one standard unit of credit only in the career and technical education concentration or specialization.

Two student-selected verified credits will be awarded for passing each certification or licensure examination or occupational competency assessment that meets all of the above criteria if the student
- meets the CTE concentration or specialization course requirements for program completer, and
- earns at least two standard units of credit in the CTE concentration or specialization.

Seals

In September 2000, the Board of Education approved criteria for selecting and approving certifications and licenses to satisfy the requirements for the Career and Technical Education Seal and the Advanced Mathematics and Technology Seal.
- The examination must be in a CTE field that confers a certification from a recognized industry, trade, or professional association. For the technology requirements of the Board's Seal of Advanced Mathematics and Technology, students may elect to pass a Board-approved exam that confers college-level credit in a technology or computer science area.
- The examination must be standardized and graded independently of the school or school division in which the student is enrolled.
- The examination must be knowledge-based.
- The examination must be administered on a multi-state or international basis.
- The course of study for which the student receives a certification must be designed to prepare the student for an occupation or occupational area or for the college-level credit in an occupation or occupational area that is technology-driven.

To earn a *Career and Technical Education Seal*, a student must
- fulfill the requirements for either a standard or advanced studies diploma, **and**
- complete a prescribed sequence of courses in a CTE concentration or specialization, **and**
- maintain a B or better average in CTE courses, **or**
- pass an exam that confers certification from a recognized industry, trade, or professional association or acquire a professional license in a career and technical field.

Certifications and licenses approved by the Virginia Board of Education for the Career and Technical Education seal are listed in Section 7.

To earn an *Advanced Mathematics and Technology Seal*, a student must
- fulfill the requirements for either a standard or advanced studies diploma, **and**
- satisfy all mathematics requirements for the Advanced Studies Diploma with a B average or better, **and**
- pass an exam that confers certification from a recognized industry, trade, or professional association, **or**
- pass an exam approved by the Board that confers college-level credit in a technology or computer science area.

College credit examinations and certifications approved by the Virginia Board of Education for the Advanced Mathematics and Technology Seal are listed in Section 7.

About the Guide

This edition of the Administrative Planning Guide is divided into the following sections:

Section 1: Introduction defines terms and indexes all courses by program or service area. This index chart refers readers to page numbers for related information such as course description, course sequences, and certification/license/occupational competency assessment overviews.

Section 2: Courses and Course Descriptions lists all CTE courses in alphabetical order and describes each in terms of grade level, prerequisite (if any), and content focus.

Section 3: Course Sequences lists all CTE courses in alphabetical order and presents completer options in terms of approved concentration and specialization sequences.

Section 4: Certification/License/Assessment Overviews presents alphabetically the overviews of all certifications, licenses, and occupational competency assessments available for completers of certain course sequences and identifies the requirements and provider.

Section 5: Verified Credits lists the requirements for verified credits and certifications/licenses/assessments that count toward the student-selected verified credit.

Section 6: Career and Technical Education Seal lists the requirements for and certifications and licenses approved for the Career and Technical Education seal.

Section 7: Advanced Mathematics and Technology Seal lists the requirements for and certifications and licenses approved for the Advanced Mathematics and Technology seal.

Section 8: Career Planning explains the nationally accepted concept of career clusters, pathways, and occupational specialties and how this organizational system helps with career exploration.

Section 9: Middle School Career Exploration presents topics for career exploration and the courses that support them.

Section 10: Elementary School Career Awareness presents courses that expose elementary school students to career skills.

Section 11: Comments and Questions contains contact information for the Virginia Department of Education, Office of Career and Technical Education Services.

Courses by Program Content Area

The following charts list middle and high school courses by program content area and focus and indicates the section and page number where each description, sequence, and credential overview appears. High school courses are described in Section 2 and middle school courses in Section 9. Course sequences are listed in Section 3, and certifications, assessments, and licenses are described briefly in Section 4.

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AGRICULTURAL EDUCATION
Focus: Agriculture and natural resources AGRICULTURAL EDUCATION
Focus: Agriculture and natural resources

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Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Middle School Courses				
Introduction to Agriscience Grade 6 ANR8002	9-2			
Agriscience Exploration Grade 7 ANR8003	9-2			
Agriscience and Technology Grade 8 ANR8004	9-2			
Fundamental Courses				
Agricultural Mechanics and Basic Plant Science ANR8006	2-4	3-3		
Agricultural Mechanics and Basic Animal Science ANR8008	2-4	3-3		
Agricultural Business				
Agricultural Business Fundamentals ANR8022	2-4	3-2		
Agricultural Business Operations ANR8024	2-4	3-2		
Agricultural Business Management ANR8026	2-4	3-2		
Agricultural Machinery Service				
Agricultural Power and Equipment ANR8016	2-5	3-4	Outdoor Power Equipment Certification (EETC)	4-28
			Agriculture Mechanics Assessment (NOCTI 1002)	4-2
Agricultural Mechanization Sales and Service ANR8018	2-5	3-4	Agriculture Mechanics Assessment (NOCTI 1002)	4-2
Advanced Agricultural Mechanization ANR8020	2-1	3-1		
Agricultural Production				
Agricultural Production Technology ANR8010	2-5	3-4	Production Agriculture Assessment (NOCTI 1063)	4-29
Agricultural Production Management ANR8012	2-5	3-4	Production Agriculture Assessment (NOCTI 1063)	4-29
Operating the Farm Business ANR8014	2-32	3-35		
Natural Resources Management				
Introduction to Natural Resources ANR8040	2-27	3-28	Forestry Products & Processing Assessment (NOCTI 2037)	4-16
Forestry, Wildlife, and Soil Management ANR8042	2-21	3-20	Forestry Products & Processing Assessment (NOCTI 2037)	4-16
Natural Resources Business Management ANR8044	2-31	3-32		
Horticulture				
Horticulture Sciences ANR8034	2-23	3-22	Greenhouse Operators Certification Program (Southern Greenhouse Growers Association)	4-17
			Horticulture-Floriculture Assessment (NOCTI 2049)	4-17
			Horticulture-Landscaping Assessment (NOCTI 2149)	4-17
			Horticulture-Olericulture Assessment (NOCTI 2249)	4-18
Floral Design I ANR8055	2-20	3-20	Greenhouse Operators Certification Program (Southern Greenhouse Growers Association)	4-17

Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Floral Design II ANR8056	2-20	3-20	Greenhouse Operators Certification Program (Southern Greenhouse Growers Association)	4-17
Floriculture ANR8038	2-21	3-20	Greenhouse Operators Certification Program (Southern Greenhouse Growers Association)	4-17
			Horticulture-Floriculture Assessment (NOCTI 2049)	4-17
Greenhouse Plant Production and Management ANR8035	2-22	3-21	Greenhouse Operators Certification Program (Southern Greenhouse Growers Association)v	4-17
			Horticulture-Olericulture Assessment (NOCTI 2249)	4-18
Landscaping ANR8036	2-28	3-28	Horticulture-Landscaping Assessment (NOCTI 2149)	4-17
Specialty Horticulture Arts ANR8037	2-37	3-40	Greenhouse Operators Certification Program (Southern Greenhouse Growers Association)	417
Specialized Courses				
Applied Agricultural Concepts ANR8072/8073	2-5	3-4		
Biological Applications in Agriculture ANR8086	2-7	3-6		
Turf Establishment and Maintenance ANR8051	2-39	3-41		
Advanced Turf Grass Applications ANR8054	2-3	3-2		
Ecology/Environmental Management ANR8045/ 8046	2-15	3-16		
Equine Management and Production ANR8015/ 8080	2-18	3-18		
Farm Equipment Operator ANR8052	2-19	3-18		
Small Animal Care I ANR8083	2-37	3-39		
Small Animal Care II ANR8084	2-37	3-39		
Small Engine Repair ANR8021/8082	2-37	3-40	Outdoor Power Equipment Certification (EETC)	4-28
			Air-Cooled Gas Engine Assessment (NOCTI 2068)	4-2
Biotechnology Program				
Biotechnology Foundations DTE9820	2-8	3-6		
Biotechnology Applications in Agriculture ANR8087	2-8	3-6		
Special Courses				
Agricultural Education for the Disadvantaged ANR8050	2-4	3-2		
Agricultural Education for the Disabled ANR8053	2-4	3-2		
General Mechanics for the Disadvantaged ANR8070	2-21	3-20		
Dual Enrollment—Postsecondary ANR8095	2-4			

BUSINESS AND INFORMATION TECHNOLOGY
Focus: Information systems, finance, management, office administration

Course	Course Description Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Foundation Courses				
Keyboarding (Middle School) BUS6150	2-27, 9-2	3-27		
Computer Solutions BUS6609/6610	2-11, 9-1	3-13		
Make It Your Business BUS6110/6111	2-29, 9-2	3-29		
Occupational Courses				
Note: For Business and Information Technology occupational courses, certifications are marked as follows: *Certification is considered an entry-level certification. ** Certification is considered a mid-level certification and may require significant curriculum "mapping." *** Certification is considered an advanced-level certification and will need to be "mapped" to curriculum at the academy level.				
Accounting BUS6320	2-1	3-1	Certification for Legal Professionals* (ALS) when combined with Office Administration and Legal Systems Administration	4-7
			IC^3 Certification* (Certiport)	4-20
			International Computer Driving License* (ICDL US)	4-20
Advanced Accounting BUS6321	2-1	3-1	Certification for Legal Professionals* (ALS) when combined with Office Administration and Legal Systems Administration	4-7
			IC^3 Certification* (Certiport)	4-20
			International Computer Driving License* (ICDL US)	4-20
Business Law BUS6131	2-8	3-7	IC^3 Certification* (Certiport)	4-20
			International Computer Driving License* (ICDL US)	4-20
Business Law BUS6132	2-8	3-7		
Business Management BUS6135	2-8	3-7	IC^3 Certification* (Certiport)	4-20
			International Computer Driving License* (ICDL US)	4-20
Business Management BUS6136	2-8	3-8		
Computer Applications BUS6611	2-10	3-10	MOS* (Microsoft Office Specialist) (Microsoft)	4-26
			IC^3 Certification* (Certiport)	4-20
			International Computer Driving License* (ICDL US)	4-20
Computer Applications BUS6617	2-10	3-10		
Computer Information Systems BUS6612	2-11	3-11	MOS* (Microsoft Office Specialist) (Microsoft)	4-26
			IC^3 Certification* (Certiport)	4-20
			International Computer Driving License* (ICDL US)	4-20
			See possibility of digital media certifications in Desktop/Multimedia Presentations.	
Computer Information Systems BUS6614	2-11	3-11		
Advanced Computer Information Systems BUS6613	2-1	3-1	Certification in Convergent Network Technologies (CCNT)	4-7
			IC^3 Certification* (Certiport)	4-20
			International Computer Driving License* (ICDL US)	4-20
			Microsoft Office Specialist (MOS) (Microsoft)	4-20

Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Advanced Computer Information Systems BUS6615	2-1	3-1		
Computer Network Software Operations BUS6650	2-11	3-12	A+* (CompTIA)	4-1
			Certified in Convergent Network Technologies (CCNT*) (ProsoftTraining)	4-7
			Certified Novell Administrator* (Novell)	4-9
			CIW Associate* (ProsoftTraining)	4-9
			CIW Professional* (ProsoftTraining)	4-9
			Customer Support Specialist Certification* (Help Desk Institute)	4-13
			IC^3* (Certiport)	4-20
			iNet* (CompTIA)	4-20
			International Computer Driving License* (ICDL US)	4-20
			IT Essentials Certificate, Level 1* (Cisco Systems)	4-20
			IT Essentials Certificate, Level 2* (Cisco Systems)	4-21
			Linux +* (CompTIA)	4-21
			Microsoft Certified Professional (MCP)* (Microsoft)	4-24
			MCP: Installing, Configuring, and Administering Microsoft Windows 2000 Professional* ((Microsoft)	4-24
			MCP: Installing, Configuring, and Administering Microsoft Windows 2000 Server* (Microsoft)	4-24
			MOS* (Microsoft)	4-26
			Unix Certificate* (Cisco Systems)	4-31
			Voice and Data Cabling Certificate* (Cisco Systems)	4-31

Course	Course Description Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Advanced Computer Network Software Operations BUS6651	2-1	3-1	A+* (CompTIA)	4-1
			Certified in Convergent Network Technologies (CCNT*) ProsoftTraining)	4-7
			Certified Novell Administrator* (Novell)	4-9
			CIW Associate* (ProsoftTraining)	4-9
			CIW Professional* (ProsoftTraining)	4-9
			Customer Support Specialist Certification* (Help Desk Institute)	4-13
			IC^3* (Certiport)	4-20
			iNet* ((CompTIA)	4-20
			International Computer Driving License* ((ICDL US)	4-20
			IT Essentials Certificate, Level 1* (Cisco Systems)	4-20
			IT Essentials Certificate, Level 2* (Cisco Systems)	4-21
			Linux +* (CompTIA)	4-21
			Microsoft Certified Professional (MCP)* (Microsoft)	4-24
			MCP: Installing, Configuring, and Administering Microsoft Windows 2000 Professional* (Microsoft)	4-24
			MCP: Installing, Configuring, and Administering Microsoft Windows 2000 Server* (Microsoft)	4-24
			MOS* (Microsoft)	4-26
			Network +* (CompTIA)	4-27
			Unix Certificate* (Cisco Systems)	4-31
			Voice and Data Cabling Certificate* (Cisco Systems)	4-31
Database Design and Management (Oracle) BUS6660	2-13	3-14	IC^3* (Certiport)	4-20
			International Computer Driving License* (ICDL US)	4-20
			MOS* (Microsoft)	4-26
			Oracle Certified Professional (Any Oracle Professional Certification Exam*)* (Oracle)	4-27
Advanced Database Design and Management (Oracle) BUS6661	2-1	3-1	Brainbench Java 2 Fundamentals Certification* (Brainbench)	4-5
			Brainbench Java 2 Certification* (Brainbench)	4-5
			IC^3* (Certiport)	4-20
			International Computer Driving License* (ICDL US)	4-20
			Java Programming Certificate* (Cisco Systems)	4-21
			MOS* (Microsoft)	4-26
			Oracle Certified Professional (Any Oracle Professional Certification Exam* (Oracle)	4-27
			Sun Certified Programmer for Java2 Platform (Sun Microsystems)	4-31

Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Desktop /Multimedia Presentations BUS6630	2-14	3-15	Adobe Certified Expert* (Adobe)	4-1
			Brainbench Adobe Illustrator Certification* (Brainbench)	4-3
			Brainbench Adobe PageMaker Certification* (Brainbench)	4-3
			Brainbench Adobe Photoshop Certification* (Brainbench)	4-3
			Brainbench Certified Internet Professional: Page Layout** (Brainbench)	4-4
			Brainbench CorelDRAW Certification* (Brainbench)	4-4
			Brainbench Dreamweaver Certification* (Brainbench)	4-4
			Brainbench Fireworks Certification* (Brainbench)	4-4
			Brainbench Flash Certification* (Brainbench)	4-4
			Brainbench HTML Certification* (Brainbench)	4-5
			Brainbench JavaScript Certification* (Brainbench)	4-5
			Brainbench Macromedia FreeHand Certification* (Brainbench)	4-5
			Brainbench MS FrontPage 2000 Certification* (Brainbench)	4-6
			CIW Associate* (ProsoftTraining)	4-9
			CIW Professional* (ProsoftTraining)	4-9
			IC^3* (Certiport)	4-20
			iNet* (CompTIA)	4-20
			International Computer Driving License* (ICDL US)	4-20
			Macromedia Certified Professional* (Macromedia)	4-22
			MOS* (Microsoft)	4-26
			Web Design Certificate* (Cisco Systems)	4-31
			WOW Certified Apprentice Webmaster* (World Organization of Webmasters)	4-32
			WOW Certified Web Administrator Apprentice* (World Organization of Webmasters)	4-32
			WOW Certified Web Designer Apprentice* (World Organization of Webmasters)	4-32
			WOW Certified Web Developer Apprentice* (World Organization of Webmasters)	4-32
Desktop /Multimedia Presentations BUS6632	2-14	3-15		

Course	Course Description Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Advanced Desktop/Multimedia Presentations BUS6631	2-2	3-1	Adobe Certified Expert* (Adobe)	4-1
			Brainbench Adobe Illustrator Certification* (Brainbench)	4-3
			Brainbench Adobe PageMaker Certification* (Brainbench)	4-3
			Brainbench Adobe Photoshop Certification* (Brainbench) (Brainbench)	4-3
			Brainbench Certified Internet Professional: Page Layout** (Brainbench)	4-4
			Brainbench CorelDRAW Certification* (Brainbench)	4-4
			Brainbench Dreamweaver Certification* (Brainbench)	4-4
			Brainbench Fireworks Certification* (Brainbench)	4-4
			Brainbench Flash Certification* (Brainbench)	4-4
			Brainbench HTML Certification* (Brainbench)	4-5
			Brainbench JavaScript Certification* (Brainbench)	4-5
			Brainbench Macromedia FreeHand Certification* (Brainbench)	4-5
			Brainbench MS FrontPage 2000 Certification* (Brainbench)	4-6
			CIW Associate* (ProsoftTraining)	4-9
			CIW Professional* (ProsoftTraining)	4-9
			IC^3* (Certiport)	4-20
			iNet* (CompTIA)	4-20
			International Computer Driving License* (ICDL US)	4-20
			Macromedia Certified Professional* (Macromedia)	4-22
			MOS* (Microsoft)	4-26
			Web Design Certificate* (Cisco Systems)	4-31
			WOW Certified Apprentice Webmaster* (World Organization of Webmasters)	4-32
			WOW Certified Web Administrator Apprentice* (World Organization of Webmasters)	4-32
			WOW Certified Web Designer Apprentice* (World Organization of Webmasters)	4-32
			WOW Certified Web Developer Apprentice* (World Organization of Webmasters)	4-32
Advanced Desktop/Multimedia Presentations BUS6633	2-2	3-1		
Digital Input Technologies BUS6161	2-14	3-16	MOS* (Microsoft)	4-26
Digital Input Technologies BUS6160	2-14	3-16		
Finance BUS6120	2-20	3-19	IC^3* (Certiport)v	4-20
			International Computer Driving License* (ICDL US)	4-20
Finance BUS6121	2-20	3-19		

Course	Course Description Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Information Technology Fundamentals BUS6670	2-24	3-23	A+* (CompTIA)	4-1
			IC^3 * (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
			IT Essentials Certificate, Level 1* (Cisco Systems)	4-20
			MOS* (Microsoft)	4-26
Keyboarding (Secondary) BUS6151	2-27	3-27		
Keyboarding Applications BUS6152	2-28	3-27	MOS* (Microsoft)	4-26
Keyboarding Applications BUS6153	2-28	3-27		
Legal Systems Administration BUS6735	2-28	3-28	Certification for Legal Professionals* (ALS) when combined with Office Administration and Accounting	4-7
			IC^3 Certification* (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
			MOS* (Microsoft)	4-26
Legal Systems Administration BUS6736	2-28	3-28		
Medical Systems Administration BUS6730	2-30	3-31	IC^3 Certification* (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
			MOS* (Microsoft)	4-26
Medical Systems Administration BUS6731	2-30	3-31		
Notetaking BUS6241/6142	2-31	3-31		
Office Administration BUS6621	2-32	3-33	Certification for Legal Professionals* (ALS) when combined with Accounting and Legal/Medical Systems Administration)	4-7
			IC^3 Certification* (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
			MOS* (Microsoft)	4-26
Office Administration BUS6622	2-32	3-33		
Principles of Business and Marketing BUS6115	2-34	3-36	IC^3 Certification* (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
Principles of Business and Marketing BUS6116	2-34	3-36		
Programming BUS6640	2-35	3-37	CIW Associate* (ProsoftTraining)	4-9
			CIW Professional* (ProsoftTraining)	4-9
			IC^3 Certification* (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
			Microsoft Certified Professional (MCP) (Microsoft)	4-24
			MCP: Visual Basic 6.0* (Microsoft)	4-24
			MCP: Visual C++ 6.0* (Microsoft)	4-25

Course	Course Descrip- tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Advanced Programming BUS6641	2-3	3-2	Brainbench Java 2 Fundamentals Certification* (Brainbench)	4-5
			Brainbench Java 2 Certification* (Brainbench)	4-5
			CIW Associate* (ProsoftTraining)	4-9
			CIW Professional* (ProsoftTraining)	4-9
			IC^3 Certification* (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
			Java Programming Certificate* (Cisco Systems)	4-21
			Microsoft Certified Professional (MCP)* (Microsoft)	4-24
			MCP: Visual Basic 6.0* (Microsoft)	4-24
			MCP: Visual C++ 6.0* (Microsoft)	4-25
			Sun Certified Programmer for Java 2 Platform* (Sun Microsystems)	4-31
Word Processing BUS6625	2-41	3-41	IC^3 Certification* (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
			MOS* (Microsoft)	4-26
Word Processing BUS6626	2-41	3-41		
Special Programs				
Office Specialist I BUS6740	2-32	3-34	IC^3 Certification* (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
			MOS* (Microsoft)	4-26
Office Specialist II BUS6741	2-32	3-34	IC^3 Certification* (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
			MOS* (Microsoft)	4-26
Office Specialist III BUS6742	2-32	3-34	IC^3 Certification* (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
			MOS* (Microsoft)	4-26
Business and Information Technology Dual Enrollment BUS6810	2-8			
International Baccalaureate Business Management IB6135	2-24	3-24		
International Baccalaureate Information Technology in a Global Society IB6613	2-24	3-24	IC^3 Certification* (Certiport)	4-20
			International Computer Driving License (ICDL US)*	4-20
			MOS* (Microsoft)	4-26

FAMILY AND CONSUMER SCIENCES
Focus: Early childhood education, consumer services, interior design, fashion design, foods/nutrition, hospitality, family and human services, home management

Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Middle School Courses				
Exploring Work and Family Roles FCS8204/ 8206/8208/8241/8242/8243/8244/8245	9-4			
Family Focus				
Family Relations FCS8223/8225	2-19	3-18		
Individual Development FCS8209/8210	2-24	3-23		
Life Planning FCS8226/FCS8227	2-28	3-30		
Nutrition and Wellness FCS8228/S8229	2-32	3-33		
Parenting FCS8231/8232	2-33	3-36		
Resource Management FCS8214/8219	2-36	3-39		
Transition Focus				
Introduction to Culinary Arts FCS8249/8250	2-25	3-25		
Introduction to Early Childhood Education FCS8233/8234	2-26	3-26		
Introduction to Family and Human Services FCS8237/8238	2-26	3-26		
Introduction to Fashion Design and Marketing FCS8247/8248	2-26	3-26		
Introduction to Hospitality, Tourism, and Recreation FCS8258/8259	2-27	3-27		
Introduction to Housing, Home Furnishings, and Design FCS8254/8255	2-27	3-27		
Work and Family Management FCS8205/8282	2-41	3-43		
Work Focus				
Culinary Arts I FCS8275	2-13	3-13		
Culinary Arts II FCS8276	2-13	3-13	ACCESS (ACF)	4-1
			Commercial Foods Assessment (NOCTI 2020)	4-11
			Food Production Management and Services Assessment (NOCTI 2036)	4-16
			ProStart National Certificate of Achievement (Educational Foundation of the National Restaurant Association)	4-29
Early Childhood Education I FCS8285	2-15	3-16		
Early Childhood Education II FCS8286	2-15	3-16	Child Development Associate (Council for Professional Recognition)	4-10
			Early Childhood Care and Education Assessment (NOCTI 2016)	4-14
Family and Human Services I FCS8264	2-18	3-18		
Family and Human Services II FCS8265	2-19	3-18		
Fashion Design I FCS8280	2-19	3-19		
Fashion Design II FCS8281	2-19	3-19	Clothing and Textiles Management and Production Assessment (NOCTI 1018)	4-11

Course	Course Description Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Hospitality Services I FCS8202	2-23	3-22	Hospitality Skills Certification—Restaurant Server (AH&LA)	4-19
			Hospitality Skills Certification—Room Attendant (AH&LA)	4-19
			Lodging Management Program Certification, Level 1 (AH&LA)	4-22
			START Certification (AH&LA)	4-30
Hospitality Services II FCS8203	2-23	3-22	Certified Hospitality Supervisor (AH&LA)	4-8
			Hospitality Management—Food and Beverage Option Assessment (NOCTI 1079)	4-18
			Hospitality Management—Lodging Option Assessment (NOCTI 1080)	4-18
			Hospitality Skills Certification—Restaurant Server (AH&LA)	4-19
			Hospitality Skills Certification—Room Attendant (AH&LA)	4-19
			Lodging Management Program Certification, Level 2 (AH&LA)	4-22
			START Certification (AH&LA)	4-30
Interior Design I FCS8295	2-25	3-25		
Interior Design II FCS8296	2-265	3-25		
Special Programs				
GRADS FCS8277/8278/8213	2-21	3-21		
Dual Enrollment—Postsecondary FCS8266	2-18			

HEALTH AND MEDICAL SCIENCES
Focus: Nursing, EMT, dental, surgical technician, physical and occupational therapy, and veterinary aide

Course	Course Description Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Middle School Course				
Health and Medical Sciences Exploratory HMS8370	9-3			
Introductory Course				
Introduction to Health and Medical Sciences Occupations HMS8302	2-26	3-27		
Dental Assistant				
Dental Assistant I HMS8328	2-13	3-14		
Dental Assistant II HMS8329	2-14	3-14	Certified Dental Assistant: Infection Control Examination (Dental Assisting National Board)	4-7
			Certified Dental Assistant: Radiation Health & Safety Examination (Dental Assisting National Board)	4-7
			Dental Assisting Assessment (NOCTI 2026)	4-14
			NRDA Certification (National Allied Health Registry/National Association for Health Professionals)	4-27
Emergency Medical Terminology				
Emergency Medical Technician Basic-I HMS8333	2-17	3-17		
Emergency Medical Technician Basic-II HMS8334	2-17	3-17	Emergency Medical Technology (Virginia Department of Health)	4-15
Emergency Medical Technician Basic-III HMS8335	2-17	3-17		
Health Careers Cluster				
Health Assistant I HMS8331	2-22	3-21		
Health Assistant II Psychiatric Aide HMS8332	2-22	3-21	Nurse Aide (Virginia Board of Nursing)	4-27
Medical Assistant				
Medical Assistant I HMS8345	2-30	3-31		
Medical Assistant II HMS8346	2-30	3-31	Medical Assisting Assessment (NOCTI 3055)	4-23
			NRDA Certification (National Allied Health Registry/National Association for Health Professionals)	4-27
Medical Terminology				
Medical Terminology HMS8383	2-31	3-32		
Nursing Assistant				
Nursing Assistant I HMS8360	2-31	3-32		
Nursing Assistant II HMS8362	2-31	3-32	Nurse Aide (Virginia Board of Nursing)	4-27
Pharmacy				
Pharmacy Technician	2-33	3-36		
Physical Therapy				
Physical Therapy /Occupational Therapy HMS8385	2-33	3-36		
Practical Nursing				
Practical Nursing I HMS8357	2-34	3-36		
Practical Nursing II HMS8358	2-34	3-36	Nurse Aide (Virginia Board of Nursing)	4-27
			Practical Nursing (NOCTI 2062)	4-29
Practical Nursing III HMS8359	2-34	3-36		
Surgical Technology				
Surgical Technologist I HMS8351	2-37	3-39		
Surgical Technologist II HMS8352	2-38	3-39		
Veterinary Assistant				
Veterinary Assistant I HMS8310	2-40	3-41		

Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Veterinary Assistant II HMS8311	2-40	3-41		
Veterinary Assistant III HMS8312	2-40	3-41		
Occupational Mix				
Home Health Aide HMS8364	2-23	3-22		
Special Programs				
Dual Enrollment with Postsecondary HMS8394	2-22			

MARKETING
Focus: Buying, transporting, storing of goods; promotion of goods and services; market research; marketing management

Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
General Marketing				
Fundamentals of Marketing MKT8110	2-21	3-20		
Internet Marketing MKT8125	2-25	3-25		
Introduction to Marketing MKT8111	2-27	3-27		
Make It Your Business MKT8109/8112/ 8113/8114	2-29, 9-3	3-30		
Marketing MKT8120/8121	2-29	3-31	Fundamental Concepts of Business and Marketing Certificate (ASK Innstitute)	4-16
			National Professional Certification in Customer Service (S&SVP)	4-27
Advanced Marketing MKT8130/8131	2-3	3-2	Advanced Concepts of Business and Marketing Certificate ASK Institute)	4-1
			National Professional Certification in Customer Service (S&SVP)	4-27
			Retail Trades Assessment (NOCTI 2053)	4-30
Principles of Business and Marketing MKT8115/ 8116	2-34	3-37		
Executive Marketing				
International Marketing MKT8135	2-25	3-25		
Advanced International Marketing MKT8136	2-2	3-2		
Marketing Management MKT8132	2-29	3-31		
Apparel and Accessories Marketing				
Introduction to Fashion Design and Marketing MKT8148/8149	2-26	3-25		
Fashion Marketing MKT8140/8141	2-19	3-19	Fundamental Concepts of Business and Marketing Certificate (ASK Institute)	4-16
Advanced Fashion Marketing MKT8145/8146	2-2	3-2	Advanced Concepts of Business and Marketing Certificate (ASK Institute)	4-1
			Retail Trades Assessment (NOCTI 2053)	4-30
Hospitality, Tourism, and Recreation Marketing				
Hotel/Motel Marketing MKT8160/8161	2-23	3-22	Certified Hospitality Supervisor (AH&LA)	4-8
			Hospitality Skills Certification—Front Desk Agents (AH&LA)	4-18
			Lodging Management Program Certification, Level 1 (AH&LA)	4-22
Advanced Hotel/Motel Marketing MKT8162/ 8163	2-2	3-2	Certified Hospitality Supervisor	4-8
			Hospitality Management—Food & Beverage Assessment (NOCTI 1079)	4-18
			Hospitality Management—Lodging Option Assessment (NOCTI 1080)	4-18
			Hospitality Skills Certification—Front Desk Agents (AH&LA)	4-18
			Lodging Management Program Certification, Level 2 (AH&LA)	4-22
Sports, Entertainment, and Recreation Marketing MKT8175/MKT8176	2-37	3-40		
Advanced Sports, Entertainment, and Recreation Marketing MKT8177/MKT8178	2-3	3-2		
Travel and Tourism Marketing MKT8165/8166	2-39	3-41		

Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Advanced Travel and Tourism Marketing MKT8167/8168	2-3	3-2		
Financial Services Marketing				
Financial Services Marketing MKT8180/8181	2-20	3-19		
Real Estate Marketing				
Real Estate Marketing MKT8191	2-36	3-38	Real Estate Salesperson (Virginia Real Estate Board)	4-29
Special Programs				
Dual Enrollment w/Postsecondary MKT8198	2-29			

TECHNOLOGY EDUCATION
Focus: Design, technology, and engineering

Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Middle School				
Introduction to Technology DTE8483/8482/ 8484/8481	9-3			
Inventions and Innovations DTE8461/8464/8485	9-3			
Technological Systems DTE8462/8463/8486	9-3			
Design and Technology				
Technology Foundations DTE8403/8402	2-38	3-40		
Technology Transfer DTE8405/8404	2-39	3-40		
Technology Assessment DTE8407/8406	2-38	3-40		
Pre-Engineering				
Introduction to Engineering DTE8490	2-26	3-26		
Advanced Engineering DTE8491	2-2	3-2		
Communication and Information Technology				
Computer Control and Automation DTE8421/8420	2-10	3-10		
Communication Systems DTE8415/8418	2-10	3-9		
Graphic Communication Systems DTE8458/8494	2-21	3-21		
Control Technology				
Electronics Systems I DTE8416/8417	2-16	3-17	A+ (CompTIA)	4-1
			Certified Electronics Technician Associate (ETA)	4-8
Electronics Systems II DTE8412	2-16	3-17	A+ (CompTIA)	4-1
			Certified Electronics Technician Associate (ETA)	4-8
Power and Transportation DTE8445/8444	2-33	3-36		
Energy and Power DTE8448/8495	2-17	3-17		
Production Technology				
Production Systems DTE8447/8446	2-35	3-37		
Materials and Processes Technology DTE8433/ DTE8478	2-30	3-31		
Construction Technology DTE8431/8432	2-12	3-13		
Manufacturing Systems DTE8425/8426	2-29	3-30		
Advanced Manufacturing Systems DTE8427	2-3	3-2		
Technical Design and Illustration				
Technical Drawing and Design DTE8435/8434	2-38	3-41	AutoCAD 2000 (Brainbench)	4-2
Engineering Drawing and Design DTE8436/8493	2-18	3-17	AutoCAD 2000 (Brainbench)	4-2
Architectural Drawing and Design DTE8437/8492	2-5	3-4	AutoCAD 2000 (Brainbench)	4-2
Principles of Technology				
Principles of Technology I DTE9811	2-35	3-37		
Principles of Technology II DTE9812	2-35	3-37		
Biotechnology Program				
Biotechnology Foundations DTE9820	2-8	3-6		
Bioengineering DTE8467	2-7	3-6		
Special Courses				
Careers and You DTE8475	9-1			
Dual Enrollment w/Postsecondary DTE8498	2-38			

TRADE AND INDUSTRIAL EDUCATION
Focus: Communications, construction, metalworking, personal and public services, and transportation

Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Communications and Graphics				
Advertising Design TDI8570/8571/8572	2-4	3-2	Advertising Design Assessment (NOCTI 2019)	4-2
Basic Photography TDI8610	2-7	3-5		
Commercial Photography TDI8607/8608/8609	2-10	3-8		
Computer Networking Hardware Operations TDI8542/8543/8544/8545	2-11	3-12	Cisco Certified Networking Associate (CCNA) (Cisco Systems)	4-11
			Cisco CCNA Academy Certificate (CCNA:1) (Cisco Systems)	4-10
			Cisco CCNA Academy Certificate (CCNA:2) (Cisco Systems)	4-10
			Cisco CCNA Academy Certificate (Level 3) (Cisco Systems)	4-10
			Cisco CCNA Academy Certificate (CCNA:4) (Cisco Systems)	4-10
Computer Repair and Servicing TDI8621	2-11	3-12		
Computer Systems Technology TDI8622/8623/ TDI8624	2-12	3-13	A+ (CompTIA)	4-1
			Certified Computer Service Technician (ETA)	4-7
			IT Essentials, Level 1 (Cisco Systems)	4-20
Drafting TDI8530/8531/8532	2-15	3-16	AutoCAD 2000 (Brainbench)	4-2
			Drafter Certification (American Design Drafting Association)	4-14
Electronics Technology TDI8536/8537/8538	2-17	3-17	Certified Computer Service Technician (ETA)	4-7
			Certified Electronics Technician Associate (ETA)	4-8
			Certified Satellite Dish Installer (ETA)	4-9
			Consumer Electronics Certification (CEC) (ETA)	4-13

Course	Course Description Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Graphic Imaging Technology TDI8660/8661/ TDI8662	2-22	3-21	Adobe Certified Expert (Adobe)	4-1
			Brainbench Adobe Illustrator Certification (Brainbench)	4-3
			Brainbench Adobe PageMaker Certification (Brainbench)	4-3
			Brainbench Adobe Photoshop Certifcation (Brainbench)	4-3
			Brainbench CorelDRAW Certification (Brainbench)	4-4
			Brainbench Dreamweaver Certification (Brainbench)	4-4
			Brainbench Fireworks Certification (Brainbench)	4-4
			Brainbench Flash Certification (Brainbench)	4-4
			Brainbench Macromedia FreeHand Certification (Brainbench)	4-5
			Brainbench MS FrontPage 2000 Certification	4-6
			Brainbench Quark Xpress Certification (Brainbench)	4-6
			Graphic Communications Technology Assessment (NOCTI 4042)	4-16
			Macromedia Certified Professional (Macromedia)	4-22
			PrintED Certfication (all exams) (Graphic Arts Education and Research Foundation)	4-29
Radio Communications TDI8640/8641/8642	2-36	3-38		
Robotic Workcell Technology TDI8557/8558/ TDI8559	2-36	3-39		
Telecommunications TDI8650/8651	2-39	3-41		
Television Production TDI8688/8689/8690	2-39	3-41	Audio-Visual Communications Assessment (NOCTI 2005)	4-2
Construction				
Basic Carpentry TDI8600	2-7	3-5		
Brick Layer TDI8511	2-8	3-6		
Building Trades TDI8515/8516/8517	2-8	3-6	Carpentry, Level 1 Certification (NCCER)	4-6
			Construction Fundamentals Certification (NCCER)	4-12
			Electrical, Level 1 Certification (NCCER)	4-15
			Masonry, Level 1 Certification (NCCER)	4-22
			Plumbing, Level 1 Certification (NCCER) (NCCER)	4-28
Cabinetmaking TDI8604/8605/8606	2-9	3-8	Cabinetmaking Assessment (NOCTI 1014)	4-6
			Construction Fundamentals Certification (NCCER)	4-12
Carpentry TDI8601/8602/8603	2-9	3-8	Carpentry Assessment (NOCTI 1014)	4-6
			Carpentry, Level 1 Certification (NCCER)	4-6
			Construction Fundamentals Certification (NCCER)	4-12
Custodial Services TDI8590/8591/8592	2-13	3-13		

Course	Course Description Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Electricity and Cabling TDI8533/8534/8535	2-16	3-17	BICSI Registered Installer, Level 1 (BISCI/International Telecommunications Association)	4-3
			Certified Fiber Optics Installer (Association of Communications and Electronics Schools, International)	4-8
			Certified Satellite Disk Installer (ETA)	4-9
			Construction Electricity Assessment (NOCTI 1024)	4-12
			Construction Fundamentals Certification (NCCER)	4-12
			Copper-Based Cabling Certification (RBT Systems)	4-13
			Electrical, Level 1 Certification (NCCER)	4-15
			Fiber Optic Network Cabling Certification (RBT Systems)	4-15
			Fiber Optics Installer (ETA)	4-16
			Graymark Cable Installation Certification (Graymark International)	4-17
			Voice and Data Cabling Certification (Cisco Systems)	4-31
Heating, Ventilation, Air Conditioning, and Refrigeration TDI8503/8504/8505	2-22	3-22	Air Conditioning Certification (HVAC Excellence)	4-2
			Commercial Air Conditioning Certification (HVAC Excellence)	4-11
			Commercial Refrigeration Certification (HVAC Excellence)	4-12
			Electrical Certification (HVAC Excellence)	4-14
			Electric Heat Certification (HVAC Excellence)	4-15
			EPA Technician Certification (Core Exam I, II, or III) (Environmental Protection Agency)	4-15
			Gas Heat Certification (HVAC Excellence)	4-16
			Heat Pump Certification (HVAC Excellence)	4-17
			HVAC, Level I Certification (NCCER)	4-19
			Installer Core Certification (NATE)	4-20
			Light Commercial Heating & Air Conditioning (ARI)	4-21
			Oil Heat Certification (HVAC Excellence)	4-27
			Residential Air-Conditioning and Heating Certification (ARI)	4-30
			Service Core Certification (NATE)	4-30

Course	Course Description Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Masonry TDI8512/8513/8514	2-30	3-31	Construction Fundamentals Certification (NCCER)	4-12
			Construction Masonry—Blocklaying Assessment (NOCTI 2025)	4-12
			Construction Masonry—Bricklaying Assessment (NOCTI 2125)	4-12
			Masonry, Level I Certification (NCCER)	4-22
Plumbing TDI8551/8552/8553	2-333	3-36	Construction Fundamentals Certification (NCCER)	4-12
			Plumbing Assessment (NOCTI 2061)	4-28
			Plumbing, Level 1 Certification (NCCER)	4-28
Utility/Heavy Construction Technology TDI8616/ TDI8617/8618	2-40	3-41		
Metals				
Industrial Maintenance Technology TDI8575/ TDI8576/8577	2-24	3-23	Hydraulics Specialist Certification (Fluid Power Society)	4-19
			Pneumatic Technician ((Fluid Power Society)	4-28
Precision Machining Technology TDI8539/8540/ TDI8941	2-34	3-37	Machining Skills—Level 1 (NIMS)	4-22
Sheet Metal TDI8663/8664/8665	2-36	3-39	Metalforming Skills—Level 1 (NIMS)	4-23
Welding TDI8672/8673/8674	2-40	3-41	SENSE (American Welding Society)	4-30
			Welding, Level 1 Certification (NCCER)	4-31
Personal Services				
Commercial Sewing TDI8524/8525/8526	2-10	3-9		
Cosmetology TDI8527/8528/8529	2-12	3-13	Cosmetology (Virginia Board of Cosmetology)	4-13
Culinary Arts TDI8521/8522/8523	2-12	3-13	ACCESS ACF	4-1
			Commercial Foods Assessment (NOCTI 2020)	4-11
			Food Production, Management, and Services Assessment (NOCTI 2036)	4-16
			ProStart National Certification of Achievement (Exit Exam) (Educational Foundation of the National Restaurant Association)	4-29
Nail Technician TDI8692/8693	2-31	3-32	Nail Technician (Virginia Board of Cosmetology)	4-26
Protective Services				
Criminal Justice TDI8702/8703/8704	2-12	3-13	Law Enforcement Assessment (NOCTI 1081)	4-21
Firefighting TDI8705/8706/8707	2-20	3-19		
Public Safety TDI8700/8701	2-35	3-38		
Transportation				
Aircraft Pilot Training TDI8731/8732	2-5	3-4		
Aviation Maintenance Technology TDI8728/ TDI8729	2-7	3-5		
Automotive Body Technology—Certified TDI8676/ TDI86877TDI8678	2-6	3-4	Collision Repair and Refinishing Technician (ASE)	4-11
			Damage Analysis and Estimating Certification (ASE)	4-13
Automotive Body Repair—Noncertified TDI8679/ TDI8680/8681	2-6	3-4		

Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Automotive Service Technology—Certified TDI8506/8507/8508	2-6	3-4	Automotive Technician (ASE)	4-3
			Parts Specialist: Automobile or Medium/Heavy Truck (ASE)	4-28
Auto Servicing—Noncertified TDI8710/8711/ TDI8712	2-6	3-5		
Automotive Maintenance TDI8709	2-6	3-5		
Basic Automotive Body Repair (1 year course) TDI8675	2-7	3-5		
Basic Small Engine Repair TDI8724	2-7	3-6		
Diesel Equipment Technology TDI8613/8614/ TDI8615	2-14	3-15		
Small Engine Repair TDI8725/8726/8727	2-37	3-40	Air Cooled Gas Engine Repair (NOCTI 2068)	4-2
			Outdoor Power Equipment Certification (EETC)	4-28
Cooperative Education				
Industrial Cooperative Training TDI8901/8902/ TDI8903/8904	2-24	3-23		
Special Programs				
Dual Enrollment—Postsecondary TDI8801	2-39			

CAREER CONNECTIONS
Focus: Career exploration, entrepreneurship, leadership, Education for Employment

Course	Course Descrip-tion Page #	Course Sequence Page #	Certification, License, or Assessment Available	Credential Overview Page #
Career Pathways				
Phase 1: Career Exploration CCN9070	2-9, 9-1	3-8		
Phase 2: Career Skills CCN9071	2-9, 9-1	3-8		
Phase 3: Career Match CCN9072	2-9	3-8		
Education for Employment				
EFE Introduction CCN9075/CCN9076/CCN9082/ CCN9083	2-15	3-17		
EFE Level 1 CCN9077/CCN9078/CCN9084/ CCN9085	2-16	3-17		
EFE Level 2 CCN9079/CCN9080/CCN9086/ CCN9087	2-16	3-17		
EFE Cooperative Education CCN9020/CCN9021/ CCN9030, CCN9031	2-16	3-17		
Entrepreneurship				
Exploring Entrepreneurship CCN9093	2-18	3-18		
Entrepreneurship Education CCN9094	2-18	3-18		
Leadership				
Introduction to Leadership CCN9091	2-27	3-27		
Leadership Development CCN9092	2-28	3-28		
Teacher Cadet				
Teacher Cadet CCN9062	2-38	3-40		
ProTeam CCN9060/CCN9061	9-4			

Section 2: High School Courses and Course Descriptions

Section 2 describes all high school CTE courses.

Courses are listed in alphabetical order. Each description tells you the name of course, course code, grade level, prerequisite, and content focus.

To find approved sequences involving a specific course, see Section 3.

To find details about a certification, license, or assessment available to students who complete specific sequences, see Section 4.

Middle school courses are described in Section 9.

Section 2: Courses and Course Descriptions

Accounting BUS6320
Grade Levels: 10, 11, 12 (36 weeks)
Prerequisite: Keyboarding* is recommended.
Students study the basic principles, concepts, and practices of the accounting cycle. Students learn fundamental accounting procedures using a manual and an electronic system.
*Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills

Advanced Accounting BUS6321
Grade Levels: 11, 12 (36 weeks)
Prerequisite: Accounting
Students gain in-depth knowledge of accounting procedures and techniques used to solve business problems and make financial decisions. Students use accounting and spreadsheet software to analyze and interpret business applications.

Advanced Agricultural Mechanization (V) ANR8020
Grade Level: 12 (suggested) (36 weeks)
Much of the instruction may be offered through individualized instruction and independent study. Major learning areas include operation of an agricultural machinery service department; adjustment, maintenance, and repair of planting, spraying, fertilizing, and crop harvesting equipment; diesel engine systems; organization and management of agricultural machinery dealerships; and agricultural sales techniques.

Advanced Computer Information Systems BUS6613
Grade Levels: 11, 12 (36 weeks)
Advanced Computer Information Systems BUS6615
Grade Levels: 11, 12 (18 weeks)
Prerequisite: Computer Information Systems
Students apply problem-solving skills to real-life situations through advanced integrated software applications, including multimedia presentations, printed and electronic desktop publications, and Web site development. Students work individually and in groups to explore advanced computer maintenance activities, telecommunications, programming, and networking.

Advanced Computer Network Software Operations BUS6651
Grade Level: 12 (36 weeks)
Prerequisite: Computer Network Software Operations
Advanced Computer Network Software Operations is designed to continue teaching aspects of network administration—focusing on management and support of network users and systems. Time is spent discussing responsibilities of computer professionals, training end users, evaluating new technology, developing system policies, troubleshooting workstations, managing network services and protocols, and effectively using e-mail and business communications. Students learn communications protocols, troubleshooting techniques for systems and client server networks, Web site management, and other advanced networking topics. They learn advanced techniques to install the operating systems, set up and manage accounts, load software, and set up and implement security plans. This course may include software-based network operating systems such as Novell NetWare and Microsoft Windows NT. If industry certification is the basis for this course, school divisions must plan the curriculum in cooperation with the certification provider.

Advanced Database Design and Management (Oracle) BUS6661
Grade Levels: 11, 12 (36 weeks)
Prerequisite: Database Design and Management (Oracle)
Students study Java programming and Java database applications. The basics of object-oriented programming and the Java programming language are emphasized in this instruction. Students will prepare for industry certification in database applications and programming. Industry certification course competencies will be used for the course.

Advanced Desktop/Multimedia Presentations BUS6631
Grade Levels: 11, 12 (36 weeks)
Advanced Desktop/Multimedia Presentations BUS6633
Grade Levels: 11, 12 (18 weeks)
Prerequisite: Desktop/Multimedia Presentations
Students develop advanced skill and apply journalistic principles in graphic design of written and electronic publications. Students work with sophisticated hardware and software to develop advanced-level Web sites and multimedia presentations. In addition, HTML, Java Scripting, or other industry-based Web development programming languages may be mastered for use in advanced Web site development.

Advanced Engineering DTE8491
Grade Level: 11 or 12 (36 weeks)
Prerequisite: Introduction to Engineering
To learn the applications and design process of engineering, students form engineering teams and select a group design problem. Each team uses communications, graphics, mathematics, and community resources to solve problems. Each team learns appropriate information in order to complete a project. Projects may be models, systems, or products that creatively solve an engineering problem.

Advanced Fashion Marketing MKT8145 (co-op)
Advanced Fashion Marketing MKT8146 (oe)
Grade Level: 12 (36 weeks)
Prerequisite: Marketing MKT8120/MKT8121 or Fashion Marketing MKT8140/MKT8141
Students with a career interest in apparel and accessories marketing gain in-depth knowledge of the apparel and accessories industry and skills important for supervisory-management employment in apparel businesses. They develop advanced skills unique to fashion marketing and advanced general marketing skills applied to the apparel and accessories industry. Professional selling, sales promotion, buying, merchandising, marketing research, product/service technology, and supervision as well as academic skills (mathematics, science, English, and history/social science) related to the content are part of this course. Computer/technology applications supporting this course are studied.

Advanced Hotel/Motel Marketing MKT8162 (co-op)
Advanced Hotel/Motel Marketing MKT8163 (oe)
Grade Level: 12 (36 weeks)
Prerequisite: Hotel/Motel Marketing MKT8160/MKT8161
Students gain in-depth knowledge of the marketing functions within the hotel-motel industry and the management responsibilities for those functions. They develop advanced skills in the area of hotel-motel operation in which they choose to specialize.

Advanced International Marketing MKT8136 (oe)
Grade Level: 12 (suggested) (36 weeks)
Prerequisite: Completion of Marketing MKT8120 or MKT8121 or International Marketing MKT8135 (It is recommended that students be enrolled in a foreign language course either concurrently or prior to enrolling in this course.)
Advanced International Marketing, a specialized course for students with a career interest in international trade, builds upon concepts learned in International Marketing (MKT8135). Economic and international trade concepts are reviewed, and the world environment of international trade is further explored. Students expand their knowledge about the impact of culture on international trade and continue their study of the legal and political aspects of international marketing. Global product strategies are examined. Concepts detailing entry into international markets, pricing strategies, international promotion, and marketing research are studied. Computer/technology applications supporting international marketing are explored. A review of skills and preparation required for careers in international marketing complete this course. Internships that provide "hands-on" opportunities in the international area may be available to students. Academic knowledge and skills (mathematics, science, English, and history/social science) related to the content are a part of this course.

Advanced Manufacturing Systems DTE8427
Grade Level: 11 or 12 (36 weeks)
Prerequisite: Manufacturing Systems DTE8425 (36 weeks)
Students develop an in-depth understanding of automation and its applications in manufacturing. Activities center on flexible manufacturing processes and Computer Integrated Manufacturing (CIM). Students work in teams to solve complex interdisciplinary problems that stem from the major systems in automated manufacturing.

Advanced Marketing MKT8130 (co-op)
Advanced Marketing MKT8131 (oe)
Grade Level: 12 (36 weeks)
Prerequisite: Marketing MKT8120/MKT8121
Students continue to gain knowledge of marketing functions and foundations as they relate to supervisory and management responsibilities and develop skills needed for advancement. They develop skills for supervisory positions and/or for continuing education in a marketing-related field. Academic skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Advanced Programming BUS6641
Grade Levels: 11, 12 (36 weeks)
Prerequisite: Programming
Students use their knowledge of computer concepts and logic procedures to increase programming skills in one or more programming languages such as Visual Basic, Java, and C++. In addition, HTML, JavaScripting, or other industry-based Web development programming language is mastered for use in advanced Web page development or for use in industry certification programs.

Advanced Sports, Entertainment, and Recreation Marketing MKT8177 (co-op)
Advanced Sports, Entertainment, and Recreation Marketing MKT8178 (oe)
Grade Level: 12 (36 weeks)
Prerequisite: Sports, Entertainment, and Recreation Marketing MKT8175/MKT8176
Students will continue their study of the sports, entertainment, and recreation industry including the impact of Internet marketing and international marketing in this area. Other topics include market research, market segmentation, and sponsorships as well as planning, implementing, and evaluating SER events. Also covered will be working with agents and personal managers and appraising the role of labor unions in SER. Additional study will be focused on developing a career plan in the sports, entertainment, and recreation area. Academic skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Advanced Travel and Tourism Marketing MKT8167 (co-op)
Advanced Travel and Tourism Marketing MKT8168 (oe)
Grade Level: 12 (36 weeks)
Prerequisite: Travel and Tourism Marketing MKT8165 or MKT8166
Students gain in-depth knowledge of the marketing functions within the travel-tourism industry and the management responsibilities for those functions. They develop advanced competencies in the areas of communication, human relations, mathematics, creative selling, promotion, industry technology, and marketing research.

Advanced Turf Grass Applications ANR8054
Grade Level: 11 or 12
Prerequisite: Turf Establishment and Maintenance
Students continue to study the duties and tasks of professionals who establish and maintain turf in public areas such as golf courses; parks; athletic fields; school, industrial, and institutional campuses; and residential lawns.

Advertising Design I TDI8570
Grade Level: 10 or 11
Advertising Design II TDI8571
Grade Level: 11 or 12
Prerequisite: Advertising Design I
Advertising Design III TDI8572
Grade Level: 12
Prerequisite: Advertising Design II
Students prepare for job entry at a semi-skilled level as advertising artists, fashion illustrators, and technical illustrators.

Agricultural Business Fundamentals (III) ANR8022
Grade Level: 10 or 11 (suggested) (36 weeks)
Students develop the necessary knowledge, skills, habits, and attitudes for employment in off-farm agricultural businesses. Where training centers are available, cooperative arrangements with local agricultural businesses provide occupational experiences for students. When training centers are not available, simulated experiences may be provided. Leadership training is provided through the FFA.

Agricultural Business Management (V) ANR8026
Grade Level: 12 (suggested) (36 weeks)
This occupational preparation course should be operated on a cooperative on-the-job training basis with local agricultural businesses. Much of the instruction may be individualized. The course provides further opportunities for the development of business procedures, management techniques, and agricultural product knowledge. Leadership skills continue to be developed.

Agricultural Business Operations (IV) ANR8024
Grade Level: 11 or 12 (suggested) (36 weeks)
Wherever possible, students participate in cooperative on-the-job training programs with local agricultural businesses. The curriculum emphasizes off-farm agricultural occupations, business procedures, merchandising, marketing, and agricultural business management. Instruction is provided in agricultural product knowledge, agricultural mechanics, plant science, and leadership development.

Agricultural Education for the Disabled ANR8050
Agricultural Education for the Disadvantaged ANR8053
For information, please contact the Agricultural Education Service, Virginia Department of Education.

Agricultural Education Dual Enrollment with Postsecondary ANR8095
For information, please contact the Agricultural Education Service, Virginia Department of Education.

Agricultural Mechanics and Basic Animal Science (Level II) ANR8008
Grade Level: 9 or 10 (suggested) (36 weeks, single period)
Students continue to learn agricultural mechanics, with emphasis placed on fundamentals of electricity, arc welding, gas cutting and welding, small engines, power woodworking, and wood and metal preservatives. They also receive instruction in animal science and further develop competencies in rural and urban living, leadership, and resource conservation.

Agricultural Mechanics and Basic Plant Science (Level I) ANR8006
Grade Level: 8 or 9 (suggested) (36 weeks, single period)
Approximately one-half of this course is devoted to agricultural mechanics, with emphasis placed on skill development in basic metals, tool fitting and cold metals, basic arc welding, sheet metal, soldering and brazing, plan reading and sketching, and hand woodworking. The remainder of the course emphasizes the development of competencies in plant sciences, rural and urban living, leadership, and resource conservation.

Agricultural Mechanization Sales and Service (IV) ANR8018
Grade Level: 11 or 12 (suggested) (36 weeks)
Students enrolled in this course learn operating procedures in a parts department, focusing on newly developed agricultural machines, engine analysis and troubleshooting, basic hydraulics, mechanical power transfer systems, the implement industry, metal fusion and fabrication welding, and adjustment and repair of tillage equipment

Agricultural Power and Equipment (III) ANR8016
Grade Level: 10 or 11 (suggested) (36 weeks)
Students prepare for entry-level employment and advancement in the agricultural equipment industry or for the operation and maintenance of farm equipment. Students learn to use selected hand tools, precision measuring tools, and testing equipment in the maintenance of small engines. Completion of this course may prepare students for Outdoor Power Equipment Certification.

Agricultural Production Management (IV) ANR8012
Grade Level: 11 or 12 (suggested) (36 weeks)
Course includes instruction in agricultural mechanics, with emphasis placed on the application of mechanical skills to farm power and machinery, soil and water management, supervised farming programs, and leadership training.

Agricultural Production Technology (III) ANR8010
Grade Level: 10 or 11 (suggested) (36 weeks)
This course emphasizes one or more areas of plant science, animal science, soil science, agricultural business management, and agricultural mechanization, based upon the student's employment objective. Supervised occupational experience programs and leadership training are important parts of the course. When only single periods are provided, greater emphasis is placed on individualized instruction and supervised occupational experience programs.

Aircraft Pilot Training I TDI8731
Grade Level: 11
Aircraft Pilot Training II TDI8732
Grade Level: 12
Prerequisite: Aircraft Pilot Training I
Students participate in flight training, ground school, and simulator instruction to support the flight syllabus while studying meteorology, aerodynamics, navigation, physiology, airfield and flight environments, aircraft maneuvers, and aircraft weight and balance.

Applied Agricultural Concepts ANR8072
Grade Level: 9-12 (18 weeks)
Applied Agricultural Concepts ANR8073
Grade Level: 9-12 (36 weeks)
Students who have limited or no agricultural background or experience learn fundamental agricultural competencies needed for rural or urban living. Areas of instruction include meat grading and selection; maintenance of home appliances and equipment; and the study of plumbing, electrical wiring, and carpentry fundamentals. Teachers may incorporate additional competencies in the study of soil fertility and in cultural practices for shrubs, lawns, gardens, and fruit trees. The course emphasizes leadership development activities and participation in FFA activities.

Architectural Drawing/Design DTE8437
Grade Level: 10, 11, or 12 (36 weeks)
Architectural Drawing/Design DTE8492
Grade Level: 10, 11, or 12 (18 weeks)
Prerequisites: Technical Drawing/Design
Students learn the principles of architecture and increase understanding of working drawings and construction techniques learned in the prerequisite course. Experiences include residential and commercial building designs, rendering, model making, structural details, and community planning. Students use computer-aided drawing and design (CAD) equipment and established standards or codes to prepare models for presentation. The course provides information helpful for the homeowner and is especially beneficial to the future architect, interior designer, or home builder.

Automotive Body Repair I—Non-Certified TDI8679
Grade Level: 10 or 11
Automotive Body Repair II—Non-Certified TDI8680
Grade Level: 11 or 12
Prerequisite: Auto Body Repair I
Automotive Body Repair III—Non-Certified TDI8681
Grade Level: 12
Prerequisite: Auto Body Repair II
Auto Body Repair—Non-Certified is a one-year class offered to juniors or seniors. Students learn to mask, spray, and air brush automobiles. In addition, they learn to apply undercoating and practice maintenance and safety procedures.

Automotive Body Technology I—Certified TDI8676
Grade Level: 10 or 11
Automotive Body Technology II—Certified TDI8677
Grade Level: 11 or 12
Prerequisite: Auto Body Technology I—Certified
Automotive Body Technology III—Certified TDI8678
Grade Level: 12
Prerequisite: Auto Body Technology II—Certified
Students learn to repair the body and fenders of automobiles. Instruction in body preparation for painting and finishing is included.

Automotive Maintenance TDI8709
Grade Level: 10 or 11 (1 year)
Students enrolled in this 540-hour course learn fundamental skills associated with engine tune-up, electrical diagnosis and repair, lubrication and cooling system diagnosis and repair, brake system diagnosis and repair, basic fuel system diagnosis and repair, basic suspension system diagnosis and repair, and basic routine maintenance of automobiles.

Automotive Service Technology I —Certified TDI8506
Grade Level: 10 or 11
Automotive Service Technology II—Certified TDI8507
Grade Level: 11 or 12
Prerequisite: Auto Service Technology I—Certified
Automotive Service Technology III—Certified TDI8508
Grade Level: 12
Prerequisite: Auto Service Technology II—Certified
Students learn to repair fuel, electrical, cooling, brake, drive train, and suspension systems. Instruction is given also in the adjustment and repair of individual components and systems such as radiators, transmission, and carburetors. Programs are certified by ASE, allowing students to prepare for the following certification, depending on local program content: Automotive Technician, Engine Machinist, Medium and Heavy Truck Technician, School bus Technician, and Parts Specialist—Automotive or Medium/Heavy Truck.

Automotive Servicing I—Non-Certified TDI8710
Grade Level: 10 or 11
Automotive Servicing II—Non-Certified TDI8711
Grade Level: 11 or 12
Prerequisite: Auto Servicing I
Automotive Servicing III—Non-Certified TDI8712
Grade Level: 12
Prerequisite: Auto Servicing II
Students learn to make minor repairs, tune engines, and practice routine maintenance procedures. The study of electrical systems and components of the cooling system is included.

Aviation Maintenance Technology I TDI8728
Grade Level: 11
Aviation Maintenance Technology II TDI8729
Grade Level: 12
Prerequisite: AMT I
Students study aircraft systems and components, technical diagrams and charts, aerodynamics, basic electricity, and electronics as specified by FAA requirements.

Basic Automotive Body Repair TDI8675
Grade Level: 10 or 11 (1 year)
Students enrolled in this 540-hour program learn fundamental skills associated with repairing the body and fenders of automobiles, with emphasis on safe use of hand and power tools and use of spray guns to refinish the modern automobile.

Basic Carpentry TDI8600
Grade Level: 10 or 11 (one year)
Students enrolled in this 540-hour program learn fundamental skills associated with layout, framing, and construction materials and install wooden products.

Basic Photography TDI8610
Grade Level: 10 or 11 (one year)
Students enrolled in this 540-hour program will learn photographic skills such as using multiple camera formats to set up, shoot, process and present photographic images; creating images using digital technology and preparing a professional portfolio to prepare for a career in the field of photography.

Basic Small Engine Repair TDI8724
Grade Level: 10 or 11 (1 year)
Students enrolled in this 540-hour program learn skills associated with general maintenance and repair of lawnmowers, rotary tillers and portable power equipment.

Bioengineering
Grade Level: 11 or 12
Prerequisite: Biotechnology Foundations
The study of bioengineering combines engineering, medicine and other biological sciences. Students explore the process of designing and producing a variety of bio-based products. Student research and problem-based activities include a) designing artificial limbs and other organ substitutes, and b) producing and testing electronic instruments and advanced equipment used in biotechnology.

Biological Applications in Agriculture ANR8086
Grade Levels: 9-12 (36 weeks)
This course is designed to integrate science and agriculture in the Agricultural Education classroom. Students explore the world of agriculture and the biological principles associated with it. Competencies emphasize and reinforce standards of learning for biology with agricultural applications. Localities may substitute certain course competencies to facilitate the use of laboratory facilities. Approval can be requested from the Virginia Department of Education for science credit.

Biotechnology Applications in Agriculture ANR8087
Grade Level: 11 or 12
Prerequisite: Biotechnology Foundations DTE9820
This course will enable students to understand the uses of biotechnology in the fields of plant and animal agriculture, the environment, and food science. Students will develop occupational skills in agricultural biotechnology. Students will have opportunities to apply the skills and concepts needed for careers in biotechnology. The course will provide students with the knowledge to make balanced judgments regarding the benefits and concerns posed by agricultural biotechnology. The students will be involved in many research and application activities.

Biotechnology Foundations DTE9820
Grade Level: 10, 11, or 12
This course focuses on various techniques that are used to modify living organisms, or parts of organisms, to improve plants and animals, and the development of microorganisms for specific purposes. Student activities range from bioprocessing and genetic engineering to medicine, biomechanical systems, and the environment. Students gain insight and understanding about biotechnology career fields.

Brick Layer TDI8511
Grade Level: 10 or 11 (1 year)
Students enrolled in this 540-hour program learn the fundamental skills associated with laying block and brick.

Building Trades I TDI8515
Grade Level: 10 or 11
Building Trades II TDI8516
Grade Level: 11 or 12
Prerequisite: Building Trades I
Building Trades III TDI8517
Grade Level: 12
Prerequisite: Building Trades II
This group of instructional programs prepares students to erect, install, maintain, and repair buildings, and other structures using materials such as metal, wood, stone, brick, glass, concrete and composition substances. Students develop skills in estimating costs; cutting, fastening, and fitting various materials; using hand and power tools; and following technical specifications and blueprints.

Business and Information Technology Dual Enrollment BUS6810
For information, please contact the Business and Information Technology Program Service, Virginia Department of Education.

Business Law BUS6131
Grade Levels: 10, 11, 12 (36 weeks)
Business Law BUS6132
Grade Levels: 10, 11, 12 (18 weeks)
Students examine the foundations of the American legal system. Students explore economic and social concepts as they relate to legal principles and to business and personal laws.

Business Management BUS6135
Grade Levels: 10, 11, 12 (36 weeks)
Business Management BUS6136
Grade Levels: 10, 11, 12 (18 weeks)
Students study basic management concepts and leadership styles as they explore business ownership, planning, economics, international business, and human relations issues such as employee motivation and conflict resolution. Student leadership skills may be enhanced by internship experiences.

Cabinetmaking I TDI8604
Grade Level: 10 or 11
Cabinetmaking II TDI8605
Grade Level: 11 or 12
Prerequisite: Cabinetmaking I
Cabinetmaking III TDI8606
Grade Level: 12
Prerequisite: Cabinetmaking II
Students learn to engage in the mass production of window frames, molding, trim, panels, store fixtures, kitchen cabinets, office equipment, and other products. They practice cutting, shaping, assembling, and refinishing articles; installing hinges, catches, drawer pulls, and other hardware; and planning and drafting layouts.

Career Pathways (Career Exploration) Phase 1 CCN9070
Grade Levels: 6-12 (Time and schedule locally determined)
Phase 1 prepares students to be "career investigators." To obtain the title, students must assess their role in society, identify their role as a worker, analyze their personal assets, complete a basic exploration of career clusters and select career fields or occupations for further study, and secure a career investigator (job shadowing) position with a local employer.

Career Pathways (Career Skills) Phase 2 CCN9071
Grade Levels: 6-12 (Time and schedule locally determined)
Phase 2 consists of an in-depth study of one to four or more career clusters through a variety of investigative activities with local employers. Students observe, analyze, and report on the demand for workers, worker qualifications, organizational structures, quality control measures, selected policies and regulations, ethical issues, and rewards of work. Students who complete Phase 2 successfully qualify to become "career analysts."

Career Pathways (Career Match) Phase 3 CCN9072
Grade Levels: 11-12 (Time and schedule locally determined)
In Phase 3, students match their interests and aptitudes with occupational information, investigate a variety of pathways to career success, and reinforce the skills and knowledge needed for paid employment, particularly in the challenging 21st-century workplace. Pathways may include paid or volunteer employment experiences while the student is still in high school; continuing education opportunities such as college degree programs, apprenticeships, two-year specialized Tech Prep programs, or military experience; or any combination that will enhance progress toward a career goal.

Carpentry I TDI8601
Grade Level: 10 or 11
Carpentry II TDI8602
Grade Level: 11 or 12
Prerequisite: Carpentry
Carpentry III TDI8603
Grade Level: 12
Prerequisite: Carpentry II
In this program students lay out, fabricate, erect, install, and repair wooden structures and fixtures, using hand and power tools. Instruction in common systems of framing, construction materials, estimating, and blueprint reading is included.

Commercial Photography I TDI8607
Grade Level: 10 or 11
Commercial Photography II TDI8608
Grade Level: 11 or 12
Prerequisite: Commercial Photography I
Commercial Photography III TDI8609
Grade Level: 12
Prerequisite: Commercial Photography II
Students learn to operate air brushes, cameras, meters, and other photographic equipment. Instructional topics include composition and color dynamics, contact printing, enlarging and developing film, and processing microfilm.

Commercial Sewing I TDI8524
Grade Level: 10 or 11
Commercial Sewing II TDI8525
Grade Level: 11 or 12
Prerequisite: Commercial Sewing I
Commercial Sewing III TDI8526
Grade Level: 12
Prerequisite: Commercial Sewing II
Students become proficient in the operation of various types of sewing machines. Instruction includes design, construction, alteration, and fitting of wearing apparel.

Communication Systems DTE8415
Grade Level: 9, 10, 11, or 12 (36 weeks)
Communication Systems DTE8418
Grade Level: 9, 10, 11, or 12 (18 weeks)
This course provides experiences related to various modes of communicating information, using data, technical design, optics, graphic production, audio and video, and integrated systems. Students solve problems involving input, process, output, and feedback processes. Also, students learn about potential career choices related to communication and impact of communication on society.

Computer Applications BUS6611
Grade Levels: 7, 8, 9, 10 (36 weeks)
Computer Applications BUS6617
Grade Levels: 7, 8, 9, 10 (18weeks)
Prerequisite: Keyboarding* is recommended.
Students develop or review correct keyboarding techniques and gain a basic knowledge of word processing, spreadsheet, database, graphics, and telecommunications applications. Students demonstrate an understanding of computer concepts through application of knowledge. Students learn to use software packages and local and worldwide network communications systems. Grade 8 Computer/Technology Standards of Learning are incorporated and reinforced in this course.
*Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills

Computer Control and Automation DTE8421 (formerly Computing Systems)
Grade Level: 9, 10, or 11 (36 weeks)
Computer Control and Automation DTE8420 (formerly Computing Systems)
Grade Level: 9, 10, or 11 (18 weeks)
Students engage in a broad study of the technical aspects of computers and their applications to production, transportation, and communication systems. Topics include computer equipment and operating systems, programming, control processing information, and social/cultural impact of computers. Problem-solving activities challenge students to plan, program, and interface devices with computer systems. Learning activities include experiences with robotics and control systems, computer-aided design, and computer-aided manufacturing.

Computer Information Systems BUS6612
Grade Levels: 10, 11, 12 (36 weeks)
Computer Information Systems BUS6614
Grade Levels: 10, 11, 12 (18 weeks)
Prerequisite: Keyboarding,*
Students apply problem-solving skills to real-life situations through word processing, spreadsheet, database, and multimedia presentation software, and through integrated software activities. Students work individually and in groups to explore computer concepts, operating systems, networks and telecommunications, and emerging technologies.
*Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills

Computer Networking Hardware Operations I TDI8542
Grade Level: 11
Computer Networking Hardware Operations II TDI8543
Grade Level: 11
Prerequisite: Computer Networking Hardware Operations I
Computer Networking Hardware Operations III TDI8544
Grade Level: 12
Prerequisite: Computer Networking Hardware Operations II
Computer Networking Hardware Operations IV TDI8545
Grade Level: 12
Prerequisite: Computer Networking Hardware Operations III
Students learn networking principles and the building and maintenance of computer networks in a Web-based, hands-on curriculum.

Computer Network Software Operations BUS6650
Grade Levels: 11, 12 (36 weeks)
Prerequisites: Keyboarding* and Information Technology Fundamentals are recommended.
Computer Network Software Operations is designed to teach many aspects of computer support and network administration. Students learn networking concepts, from usage to components, and set up peer-to-peer network systems and client server networks. Students install and configure network cards and connect them to networks. Students learn how to install the operating systems, set up and manage accounts, load software, and set up and implement security plans. This course may include software-based network operating systems such as Novell NetWare and Microsoft Windows NT. If industry certification is the basis for this course, school divisions must plan the curriculum in cooperation with the certification provider.

Computer Repair and Servicing (Computer Maintenance) TDI8621
Grade Level: 10 or 11 (1 year)
Students enrolled in this 540-hour course learn fundamental skills associated with maintenance of computers.

Computer Solutions BUS6609
Grade Levels: 7, 8 (6/9/12/18 weeks)
Computer Solutions BUS6609
Grade Levels: 7, 8 (36 weeks)
Students use the computer as a problem-solving tool to complete a variety of projects. Students participate in team-building activities that include both academic and business competencies. Basic touch keyboarding instruction is provided early in the course.

Computer Systems Technology I TDI8622
Grade Level: 10 or 11
Computer Systems Technology II TDI8623
Grade Level: 11 or 12
Prerequisite: Computer Systems Technology I
Computer Systems Technology III TDI8624
Grade Level: 12
Prerequisite: Computer Systems Technology II
Students learn to construct, troubleshoot, service, and repair computer systems, related components, and software, and install and maintain local area networks.

Construction Technology DTE8431
Grade Level: 10, 11, or 12 (36 weeks)
Construction Technology DTE8432
Grade Level: 10, 11, or 12 (18 weeks)
In this single-period laboratory course, students design, build, and test scale-model structures and work with projects that help them to understand the jobs of architects, carpenters, electricians, plumbers, surveyors, contractors, masons, design engineers, and a variety of other construction careers. (This course is a companion to Manufacturing Systems.)

Cosmetology I TDI8527
Grade Level: 10 or 11
Cosmetology II TDI8528
Grade Level: 11 or 12
Prerequisite: Cosmetology I
Cosmetology III TDI8529
Grade Level: 12
Prerequisite: Cosmetology II
Cosmetology is the study of hair, skin, and nails and their related care. Students study and prepare in a clinical lab setting, using mannequins and live models for manipulative skill practice. The program emphasizes safety and sanitation, communication, and management skills. Related areas of study include psychology, ethics, and presentation of a professional image. Competency completions prepare the student for the Virginia Board of Cosmetology licensing exam.

Criminal Justice I TDI8702
Grade Level: 10 or 11
Criminal Justice II TDI8703
Grade Level: 11 or 12
Prerequisite: Criminal Justice I
Criminal Justice III TDI8704
Grade Level: 12
Prerequisite: Criminal Justice II
Students learn the theory, principles, and techniques of developing, administering, and managing services for the safety and protection of people and property.

Culinary Arts I TDI8521
Grade Level: 10 or 11
Culinary Arts II TDI8522
Grade Level: 11 or 12
Prerequisite: Culinary Arts I
Culinary Arts III TDI8523
Grade Level: 12
Prerequisite: Culinary Arts II
Students are prepared for job entry at the semi-skilled level for food service occupations. Instructional areas include nutrition, handling and storing of food, sanitation, and the microbiology of food spoilage.

Culinary Arts I FCS8275 (formerly Food Occupations I)
Grade Level: 11 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Introduction to Culinary Arts is recommended.
Students prepare for managerial, production, and service skills used in government, commercial, or independently owned institutional food establishments and related food industry occupations. Their study includes planning, selecting, storing, purchasing, preparing, and serving food and food products; basic nutrition, sanitation, and food safety; the use and care of commercial equipment; serving techniques; and the operation of institutional food establishments. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of culinary arts are emphasized. Teachers highlight the basic skills of math, science, and communication when appropriate in content.

Culinary Arts II FCS8276 (formerly Food Occupations II)
Grade Level: 12 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Culinary Arts I is recommended.
Students extend and expand skills learned in Culinary Arts I, preparing for occupations such as chef/cook, baker/pastry helper, pastry decorator, hospitality worker, dietetic aide/assistant, food demonstrator, mixologist, and entrepreneur. Cooperative (on-the-job) education or an internship under the supervision of the instructor is an option. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of culinary arts are emphasized. Teachers highlight the basic skills of math, science, and communication when appropriate in content.

Custodial Services I TDI8590
Grade Level: 10 or 11
Custodial Services II TDI8591
Grade Level: 11 or 12
Prerequisite: Custodial Services I
Custodial Services III TDI8592
Grade Level: 12
Prerequisite: Custodial Services II
Students learn to service a variety of structures including commercial and industrial buildings and mobile homes by practicing basic cleaning, maintenance, and repair skills related to the air conditioning, heating, plumbing, and electrical systems.

Database Design and Management (Oracle) BUS6660
Grade Levels: 10-11 (36 weeks)
Prerequisite: Information Technology Fundamentals is recommended.
This first-year course includes database design and programming. Students study database fundamentals to include database development, modeling, design, and normalization. In addition, students are introduced to database programming. Students gain the skills and knowledge needed to use features of database software and programming to manage and control access to data. Industry certification competencies will be used for the course.

Dental Assistant I HMS8328
Grade Level: 11 (suggested) (36 weeks, double period)
Prerequisites: Keyboarding and Introduction to Health Occupations are strongly recommended.
Students are introduced to the careers in dentistry, including dentist (general and specialists), hygienist, dental assistant, dental laboratory technician, and dental receptionist. Students practice and learn about many of the skills utilized in these professions while attaining all the skills necessary to become a dental assistant. Study includes infection control and OSHA standards, anatomy and physiology, tooth morphology, oral histology, preventive dentistry, applied psychology, effective communication, office administration and management, use of dental software, operative dentistry techniques, and dental materials/laboratory skills.

Dental Assistant II HMS8329
Grade Level: 12 (suggested) (36 weeks, double period)
Prerequisite: Dental Assistant I
Units of study include medical emergencies, coronal polishing, oral pathology, dental roentgenology, nutrition, schedule IV drugs and pharmacology, and advanced laboratory techniques. While attending classes for part of the week, students also have an opportunity to participate in internships in local private dental offices and public health dental facilities where they participate in all phases of dental care delivery. At the completion of the program, the student is State Dental Board certified in Radiation Hygiene and Safety and in Schedule IV Drugs and is qualified to work as a dental assistant, dental receptionist, patient educator, appointment controller, and dental office manager. After two years in the field, graduates of the program are eligible to take the national examination to become a certified Dental Assistant. Many graduates choose to continue their dental education at community colleges and universities.

Desktop/Multimedia Presentations BUS6630
Grade Levels: 11, 12 (36 weeks)
Desktop/Multimedia Presentations BUS6632
Grade Levels: 11, 12 (18 weeks)
Prerequisites: Keyboarding*
Students develop proficiency in using desktop publishing software to create a variety of printed and electronic publications. Students will incorporate journalistic principles in design and layout of publications. Students work with sophisticated hardware and software to develop Web sites and multimedia presentations.
*Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills

Diesel Equipment Technology I TDI8613
Grade Level: 10 or 11
Diesel Equipment Technology II TDI8614
Grade Level: 11 or 12
Prerequisite: DET I
Diesel Equipment Technology III TDI8615
Grade Level: 12
Prerequisite: DET II
Students receive instruction in general maintenance and overhaul of diesel equipment. They learn to inspect, maintain, and repair tracks, wheels, brakes, operating controls, pneumatic and hydraulic systems, electrical circuitry, and engines. They practice welding and brazing techniques.

Digital Input Technologies BUS 6160
Grade Levels: 7, 8, or 9 (18 weeks)
Prerequisite: Keyboarding* is recommended.
Digital Input Technologies BUS6161
Grade Levels: 7, 8, or 9 (36 weeks)
Prerequisite: None
The Digital Input Technologies course introduces new and emerging tools that are quickly becoming standard in today's workplace. Students develop proficiency using Personal Data Assistants (PDAs), speech recognition software, and input tools for entering and manipulating text and data. The 36-week course offers secondary-level keyboarding skills.
*Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills

Drafting I TDI8530
Grade Level: 10 or 11
Drafting II TDI8531
Grade Level: 11 or 12
Prerequisite: Drafting I
Drafting III TDI8532
Grade Level: 12
Prerequisite: Drafting II
Students learn theory and the manipulative skills necessary to produce complete and accurate drawings based on the ideas and sketches of engineers, architects, and designers. They design and prepare mechanical, structural, and architectural plans, electronics, transmitters, power supplies, and receivers relevant to consumer electronic products as they practice electronic product troubleshooting, servicing, and safety procedures.

Early Childhood Education I FCS8285
Grade Level: 11 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Introduction to Early Childhood Education is recommended.
Students prepare to be primary providers of home-, family-, or institution-based child care services by focusing their study on the planning, organizing, and conducting of meaningful play and learning activities; child monitoring and supervision; record keeping; and referral procedures. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of early childhood education are emphasized. Teachers highlight the basic skills of math, science, and communication when appropriate in content.

Early Childhood Education II FCS8286
Grade Level: 12 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Early Childhood Education I
Students prepare for positions in child care centers as child care attendants, kindergarten aides, or child care assistants; as foster parents; or as entrepreneurs. Cooperative (on-the-job) education or an internship under the supervision of the instructor is an option. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of early childhood education are emphasized. Teachers highlight the basic skills of math, science, and communication when appropriate in the content.

Ecology and Environmental Management ANR8045
Grade Levels: 9-12 (18 weeks)
Ecology and Environmental Management ANR8046
Grade Levels: 9-12 (36 weeks)
Students develop conservation competencies and skills through the understanding of environmental concerns. Instructional content includes the care, management, and preservation of soil, air, water, and wildlife. Students identify and discuss prevalent environmental problems and learn methods and practices used to preserve natural resources and maintain a healthy ecology. Teachers incorporate specific environmental concerns and issues common to the local school community. The course emphasizes leadership activities and opportunities to participate in FFA functions.

Education for Employment (EFE)
Introduction CCN9075 (for Students Identified as Disadvantaged—18 weeks)
Introduction CCN9076 (for Students Identified as Disadvantaged—other than 18 weeks)
Introduction CCN9082 (for Students with Disabilities—18 weeks)
Introduction CCN9083 (for Students with Disabilities—other than 18 weeks)
Grade Level: 6, 7, 8, 9
Students explore independent living and workplace skills by identifying individual assets, interests, aptitudes, talents, and current occupational abilities. Through practical experiences related to daily living and work, students determine strategies to improve their assets and ways to emphasize their strengths at home, school, and in the workplace.

Education for Employment (EFE)
Level I CCN9077 (for Students Identified as Disadvantaged—18 weeks)
Level I CCN9078 (for Students Identified as Disadvantaged—other than 18 weeks)
Level I CCN9084 (for Students with Disabilities—18 weeks)
Level I CCN9085 (for Students with Disabilities—other than 18 weeks)
Grade Levels: 9, 10, 11
Students investigate various occupational fields, examine occupational requirements, and select a career pathway. They begin to focus on improving and gaining skills required for specific occupations. They practice solving real-world problems in the home, in school, and in the workplace. Level I or II includes 36-week Cooperative Education option.

Education for Employment (EFE)
Level II CCN9079 (for Students Identified as Disadvantaged—18 weeks)
Level II CCN9080 (for Students Identified as Disadvantaged—other than 18 weeks)
Level II CCN9086 (for Students with Disabilities—18 weeks)
Level II CCN9087 (for Students with Disabilities—other than 18 weeks)
Grade Levels: 10, 11, 12
Students begin to make the transition from school to work by gaining technical skills, conducting a job search, and maintaining successful employment by demonstrating positive work traits and attitudes and continuing to develop technical skills. They focus on balancing their roles of worker, family member, and citizen. Level I or II includes 36-week Cooperative Education option.

EFE Cooperative Education I CCN9020 (for Students Identified as Disadvantaged)
EFE Cooperative Education I CCN9030 (for Students with Disabilities)
EFE Cooperative Education II CCN9021 (for Students Identified as Disadvantaged)
EFE Cooperative Education II CCN9031 (for Students with Disabilities)
Recommended Grade Levels: 11, 12
This option replaces WECEP (Work Experience Cooperative Education Program)
Students receive school-based and community-based instruction organized around an approved job that leads toward their career goal. The teacher-coordinator, on-the-job training sponsor, parent, and student develop an individualized training plan that identifies learning experiences according to the student's occupational objective. The on-the-job paid training is an extension of the classroom instruction coordinated by the classroom teacher into a coherent set of performance objectives and skills.

Electricity and Cabling I TDI8533
Grade Level: 10 or 11
Electricity and Cabling II TDI8534
Grade Level: 11 or 12
Prerequisite: Electricity and Cabling I
Electricity and Cabling III TDI8535
Grade Level: 12
Prerequisite: Electricity and Cabling II
Students develop skills in the installation, operation, maintenance, and repair of residential, commercial, and industrial electrical systems. They also study dc and ac motors, controls, and electrical-distribution panels.

Electronics Systems I DTE8416 (36 weeks)
Electronics Systems I DTE8417 (18 weeks)
Grade Level: 9, 10, 11, or 12
This course engages students in electricity and electronic experiments that focus on the application of scientific theories and mathematics principles. Students solve problems using simple electrical devices and circuits and build electronic projects using dc and ac devices and circuits.

Electronics Systems II 8412 (36 weeks)
Grade Level: 10, 11, or 12
Prerequisite: Electronics Systems I
Students work with electronics devices, instruments, and circuits, building projects to apply theories and laws with electronic components such as resistors, capacitors, and transistors. They also study integrated circuits used in computers, amplifiers, television, and other equipment.

Electronics Technology I TDI8536
Grade Level: 10 or 11
Electronics Technology II TDI8537
Grade Level: 11 or 12
Prerequisite: Electronics Technology I
Electronics Technology III TDI8538
Grade Level: 12
Prerequisite: Electronics Technology II
Students learn to assemble, install, operate, maintain, repair, and troubleshoot electrical/electronic equipment used in industry and manufacturing. Digital and computer circuitry, synchro- and servo-mechanisms, mechanical power transfer systems, three-phase alternate current and electronic wave shaping are included in this program.

Emergency Medical Technician-B I HMS8333
Grade Level: 11 (36 weeks, double period)
Students focus on the role and responsibilities of emergency rescue workers, basic medical terminology, and health care skills that include first aid; cardiopulmonary resuscitation; aseptic technique; and related anatomy, physiology, and disease knowledge. Supervised work education is provided in a hospital or with rescue squads and managed by the HOE teacher.

Emergency Medical Technician-B II HMS8334
Grade Level: 12 (36 weeks, double period)
Students become skilled in identifying and dealing with emergencies such as bleeding, fractures, airway obstruction, and cardiac arrest. Instruction emphasizes proper care and use of common emergency equipment and safe methods for lifting, moving, and transporting injured persons. Supervised on-the-job training and patient-care experiences are part of the instructional program. Program completers may take the EMT state certification examination administered by the Virginia Department of Health.

Emergency Medical Technician-B III HMS8335
Grade Level: 12
This course will allow the student to strengthen the skills acquired in the basic course and build on their certification level with additional certifications and mentored experience. Students will serve as liaisons with other public safety services (fire, law enforcement, emergency management). Units of instruction include the following:
- Review of EMT-Basic skills (medical, trauma, environmental
- Pharmacology and drug dosage calculations
- Terrorist awareness and weapons of mass destruction
- Basic trauma life support certification
- Instructional theory—development of lesson plans
- Use of A/V public speaking equipment
- Mentorship

Mentorship/field rotations: This course requires a clinical mentorship for development of proficiency in patient skills. An assigned mentor will evaluate field performance and document basic skill competency.

Energy and Power DTE8448
Grade Level: 10, 11, or 12 ((36 weeks)
Energy and Power DTE8495
Grade Level: 10, 11, or 12 (18 weeks)
In this single-period laboratory course, students learn about the application of power and energy systems to common Power devices and transportation vehicles and apply theory to the practical servicing of common machines such as small gasoline engines, outboard motors, motorcycles, and lawn mowers.

Engineering Drawing/Design DTE8436
Grade Level: 10, 11, or 12 (36 weeks)
Engineering Drawing/Design DTE8493
Grade Level: 10, 11, or 12 (18 weeks)
Prerequisite: Technical Drawing/Design
Students use a graphic language for product design, technical illustration, assembly, patent, and aeronautical drawings. They increase their understanding of drawing techniques learned in the prerequisite course. Students use computers, calculators, and descriptive geometry and adhere to established standards to solve design problems. Throughout the course, they hold seminars, meet engineers, and tour technical design firms in order to learn about the benefits of the course on their future study and career. Completion of this course may contribute to a student's preparation for the AutoCAD 2000 certification examination.

Entrepreneurship Education CCN9094
Grade Levels: 11-12 (36 weeks)
This course is designed for students who wish to concentrate on strategies for career development through ownership/management of their own businesses. Although individual skills are emphasized, the focus of the course is on development of a business plan, including the following: Determination of type of business enterprise, legal considerations, location selection, financing, steps in getting the enterprise started, marketing strategy, and interaction with successful entrepreneurs.

Equine Management and Production ANR8015
Grade Levels: 9-12 (18 weeks)
Equine Management and Production ANR8080
Grade Levels: 9-12 (36 weeks)
In this course, students learn how to care for and manage horses. Equine health, nutrition, management, reproduction, training, evaluation, and showmanship are the major instructional areas. In addition, course content includes instruction in the tools, equipment, and facilities for equine enterprises. Business management topics include the economics of boarding, training, and merchandising horses. Leadership development activities are included, and participation in FFA activities is encouraged.

Exploring Entrepreneurship CCN9093
Grade Levels: 9-12 (18 weeks)
Students explore qualities of individual enterprise, or the art of succeeding in a career. They develop skills needed to advance in an ever-changing work environment. Specifically, students develop competencies in decision making, long-range planning, effective communication, accountability, responsibility, and continuing education. Both individual development and business plan development are examined as concurrent career pathways.

Family and Consumer Sciences Dual Enrollment with Postsecondary FCS8266
For information, please contact the Family and Consumer Sciences Service, Virginia Department of Education.

Family and Human Services I FCS8264
Grade Level: 11 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Introduction to Family and Human Services (recommended)
Students prepare for occupations related to individual and family health; consumer and community special services; nutrition and dietary modification; home maintenance, management, and adaptation to physical restrictions; services to homebound individuals of all ages; and services to the terminally ill. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of home and community care are emphasized. Teachers incorporate the skills of math, science, written and oral communications, and computer applications when appropriate in the content.

Family and Human Services II FCS8265
Grade Level: 12 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Family and Human Services I
Students continue to prepare for occupations related to individual, family, community health and well-being. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of home and community care are emphasized. Cooperative (on-the-job) education or an unpaid internship under the supervision of the instructor and a registered nurse is an important part of the second-level course. Teachers incorporate the skills of math, science, written and oral communications, and computer applications when appropriate in the content.

Family Relations FCS8223
Grade Levels: 9-12 (18 weeks, single period)
Family Relations FCS8225
Grade Levels: 9-12 (36 weeks, single period)
Students enrolled in Family Relations focus on analyzing the significance of the family, nurturing human development in the family throughout the life span, analyzing factors that build and maintain healthy family relationship, developing communication patterns that enhance family relationships, dealing effectively with family stressors and conflicts, managing work and family roles and responsibilities, and analyzing social forces that influence families across the life span. Teachers highlight basic skills of math, science, and communication when appropriate in the content.

Farm Equipment Operator ANR8052
Grade Level: 12 (suggested) (36 weeks)
This helps high school seniors acquire job-entry skills as operators of farm equipment. Instruction includes units on the safe operation and preventative maintenance of equipment used in planting, cultivating, fertilizing, dusting, spraying, and harvesting crops. Cooperative education is recommended as a part of this course.

Fashion Design I FCS8280
Grade Level: 11 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Introduction to Fashion Design and Marketing is recommended.
Students prepare for occupations concerned with the spectrum of clothing, apparel, and textiles production and services, including but not limited to construction, fabric and fabric care, pattern design, principles of clothing construction and selection, fitting and alterations for ready-to-wear garments, custom tailoring, and clothing maintenance. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of fashion are emphasized. Teachers highlight the basic skills of math, science, and communication when appropriate in content.

Fashion Design II FCS8281
Grade Level: 12 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Fashion Design I
Continuing their study as an in-depth extension of Fashion Design I, students focus on occupational skills identified as essential for fashion design aides, drapers, fabric demonstrators, alteration aides, costume aides, menders, and fabric/accessories clerks. Cooperative (on-the-job) education or an internship under the supervision of the instructor is an option. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of fashion are emphasized. Teachers highlight the basic skills of math, science, and communication when appropriate in content.

Fashion Marketing MKT8140 (co-op)
Fashion Marketing MKT8141 (oe)
Grade Level: 11 or 12 (suggested) (36 weeks)
In this specialized course, students gain basic knowledge of the apparel and accessories industry and skills necessary for successful employment in apparel businesses. Students develop general marketing skills necessary for successful employment in fashion marketing, general marketing skills applied to the apparel and accessories industry, and specialized skills unique to fashion marketing. Personal selling, sales promotion, purchasing, physical distribution, market planning, and product/service technology as well as academic skills (mathematics, science, English, and history/social science) related to the content are part of this course. Computer/technology applications supporting this course are studied.

Finance BUS6120
Grade Levels: 10, 11, 12 (36 weeks)
Finance BUS6121
Grade Levels: 10, 11, 12 (18 weeks)
Students explore many facets of financial decision-making involved in daily life. Skills in money management, record keeping, and banking are enhanced through the study of basic concepts of economics, insurance, credit, and other related topics. As a year offering, the course will also prepare students occupationally to plan, manage, and analyze the financial and monetary aspects and success of business enterprises, banking institutions, or other organizations.

Financial Services Marketing MKT8180 (co-op)
Financial Services Marketing MKT8181 (oe)
Grade Level: 11 or 12 (36 weeks)
In this specialized course, students with a career interest in the financial services marketing field gain an understanding of the financial services marketing industry, with emphasis in the areas of monetary systems; types of financial institutions; careers in finance; the Federal Reserve System; negotiable instruments; and advertising and public relations associated with this field. Skills necessary for entry-level employment in this industry area include mathematics, oral and written communication, and accounting procedures. Academic skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Firefighting I TDI8705
Grade Level: 10 or 11
Firefighting II TDI8706
Grade Level: 11 or 12
Prerequisite: Firefighting I
Firefighting III TDI8707
Grade Level: 12
Prerequisite: Firefighting II
Students learn to fight fires and control the outbreak of fire. Instruction includes fire department organization; use of various kinds of equipment such as extinguishers, pumps, hoses, ropes, ladders, gas masks, hydrants, and standpipe and sprinkler systems; methods of entry and rescue; salvage practices and equipment; and fire and arson inspection and investigation techniques.

Floral Design I ANR8055
Grade Level: 11 or 12 (suggested) (36 weeks)
Prerequisite: Horticultural Sciences (ANR8034)
This course offers an expanded study of floral design, which was begun in the Horticulture Sciences course. Course content covers career opportunities, floral design foundations, design applications, and the marketing of floral products. Specific design styles to be examined include mass, mass-line, line, vase, wedding, balloon, holiday, and personal-adornment arrangements. The course also emphasizes leadership activities and opportunities to participate in FFA events.

Floral Design II ANR8056
Grade Level: 11 or 12 (suggested) (36 weeks)
Prerequisite: Floral Design I (ANR8055)
Course content covers a wide range of specialty floral designs, including historical designs, contemporary designs, oriental designs, seasonal designs, floragraphy, and designs for dried arrangements, novelty pieces, special events, and sympathy work. The business aspect of the industry is addressed through the study of pricing, advertising, shop design, wire services, delivery processes, professional organizations, sales techniques, and continuing education. The course emphasizes leadership activities and opportunities to participate in FFA events.

Floriculture ANR8038
Grade Level: 11 or 12 suggested (36 weeks)
Prerequisite: Horticulture Sciences ANR8034
Students learn the basics of the horticulture plant production industry. Instruction includes the science of plant production as well as marketing and business management. Plant material identification and floral design round out this course to prepare the student for an entry-level position in the floriculture industry. Participation in FFA activities provides leadership development opportunities.

Forestry, Wildlife, and Soil Management (IV) ANR8042
Grade Level: 11 or 12 (suggested) (36 weeks)
This course includes instruction in forest protection and harvesting, fish pond ecology and management, planning and operation of a hunting and fishing preserve, wildlife ecology and management, soil and water management systems, service and operation of large power equipment, and leadership training.

Fundamentals of Marketing MKT8110
Grade Level: 10 (36 weeks)
Fundamentals of Marketing is a basic elective course offered in the three-year Marketing program. Students gain a basic understanding of marketing and its importance and develop fundamental social, economic, mathematical, marketing, job search, and occupational decision-making skills necessary for successful initial employment in retail, wholesale, or service businesses. Academic skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

General Mechanics for the Disadvantaged ANR8070
For information, please contact the Agricultural Education Service, Virginia Department of Education.

GRADS Family Focus FCS8277
Grade Levels: 9-12 (18 weeks)
GRADS Family Focus FCS8278
Grade Levels: 9-12 (36 weeks)
GRADS Work Focus FCS8213
Grade Levels: 11-12 (36 weeks, single period)
Students enrolled in the Graduation, Reality, and Dual-role Skills Program (GRADS) concentrate on developing self-esteem; using effective communication skills; maintaining positive relationships; promoting wellness, prenatal, and postnatal care; evaluating the cost of parenthood; adjusting to parenthood; understanding child development; providing child care; managing family relationships; exploring careers; applying employability skills; managing economic resources and expenditures; and balancing work and family. Teachers highlight the basic skills of math and science when appropriate in the content.

Graphic Communications Systems DTE8458
Grade Level: 10, 11, or 12 (36 weeks)
Graphic Communications Systems DTE8494
Grade Level: 10, 11, or 12 (18 weeks)
This course provides experiences related to a wide range of tools and materials used to reproduce information and images. Several mediums are used, including paper, metal, plastic, and fabric. Students develop competencies in message design, composition and assembly, film conversion and assembly, and message transfer and product conversion.

Graphic Imaging Technology I TDI8660
Grade Level: 10 or 11
Graphic Imaging Technology II TDI8661
Grade Level: 11 or 12
Prerequisite: Graphic Imaging Technology I
Graphic Imaging Technology III TDI8662
Grade Level: 12
Prerequisite: Graphic Imaging Technology II
Graphic Imaging Technology prepares students for a career in what has traditionally been called the printing industry. Students learn to design and produce print media, which includes layout, electronic imaging, offset printing, bindery and finishing, and other graphic arts related to the printing industry. Graphic Imaging Technology programs may be certified by PrintED, the certification agency for Printing Industries of America. See Graphic Imaging Technology Framework for additional information.

Greenhouse Plant Production and Management ANR8035
Grade Level: 11 or 12 suggested (36 weeks)
Prerequisite: Horticulture Sciences
Students enrolled in this course learn the operating procedures for a greenhouse. Units of instruction include developing plant production facilities, science application in plant production, and identification of plants. Business management and marketing skills are emphasized to prepare students for careers in the greenhouse plant production and management industry. Leadership development is offered through participation in FFA.

Health and Medical Sciences Dual Enrollment with Postsecondary HMS8394
For information, please contact the Health and Medical Sciences Service, Virginia Department of Education.

Health Assistant I HMS8331
Grade Level: 11 (36 weeks, double period)
Students explore careers in the allied health field by developing basic skills common to several assisting careers. They study body structure and function, principles of health, microbes and disease, and an overview of the national health and patient care system. Supervised work education or on-the-job training may begin as part of the course in hospitals, nursing homes, or public health agencies and is managed by the HOE teacher.

Health Assistant II HMS8332
Grade Level: 12 (36 weeks, triple period)
Prerequisite: Health Assistant I
Students choose advanced preparation in one of the four tracks—dental, allied health, medical, and nursing— for further classroom instruction and clinical practice. Course content is based on validated competencies for a specific worker such as dental aide, medical assistant, physical therapy aide, or respiratory therapy assistant. Students achieve advanced skills in assisting with therapeutic and emergency measures, patient rehabilitation, care of the elderly; preparing the patient for examination; and performing simple laboratory procedures and health tests. Students prepare to assist physicians, dentists, nurses, and/or therapists in hospitals, nursing homes, clinics, and public health facilities in such jobs as orderly, sterile supply aide, and physical therapy aide. Successful completion may prepare students to take the exam for Certified Nurse Aide and employment in areas such as certified nursing assistant, dental aide, and respiratory therapy assistant.

Heating, Ventilation, Air Conditioning, and Refrigeration (HVACR) I TDI8503
Grade Level: 10 or 11
HVACR II TDI8504
Grade Level: 11 or 12
Prerequisite: HVACR I
HVACR III TDI8505
Grade Level: 12
Prerequisite: HVACR II
This instructional program prepares students to install, repair, and maintain the operating conditions of heating, air conditioning, and refrigeration systems. Completion of this sequence may prepare students for certification exams for a variety of air conditioning/air distribution system technicians.

Home Health Aide HMS8364
Grade Levels: 11, 12
Prerequisites: None—Introduction to Health and Medical Sciences is strongly recommended.
Home Health Aide is designed as an "occupational mix " program that provides entry-level skills within the health-related field. It provides students with the knowledge, understanding, and basic skill training necessary for entering advanced health and medical sciences programs or locating entry-level employment as a certified nurse 's aide/home health aide in a hospital, nursing home, home for adults, private home, or other health care setting. To ensure maximum skills and employment opportunities, the curriculum is designed to be taught by both the Health and Medical Sciences instructor and the Family and Consumer Sciences teacher. Access to a clinical training facility is essential. Home Health Aide may be offered as a three-hour block senior intensified program or may (local option) be scheduled as a two year, two-hour block at the 11th and 12th grades.

Horticulture Sciences ANR8034
Grade Level: 11 or 12 suggested
In this course, students develop the necessary knowledge, skills, habits, and attitudes for entry-level employment and advancement in areas such as floriculture, landscape design, greenhouse operation, nursery plant production, and turf management. They receive instruction in using soil and other plant-growing media and in identifying, propagating, and growing horticultural plants in the greenhouse and land laboratory. Instruction is provided in safety practices and leadership development.

Hospitality Services I FCS8202
Grade Level: 11 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Introduction to Hospitality, Tourism, and Recreation (recommended)
Students begin preparation for employment in the systemwide hospitality and/or hotel/motel and restaurant related industries by focusing on principles of operations in the travel and tourism industries, hotel and lodging facilities, food services, recreation, hospitality planning, and business operations. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of hospitality are emphasized. Teachers highlight the basic skills of math, science, and communication when appropriate in content.

Hospitality Services II FCS8203
Grade Level: 12 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Hospitality Services I (recommended)
Students continue this in-depth extension of Hospitality Services I by mastering occupational skills for workers serving as airline flight attendants, airline lounge receptionists, passenger service representatives, hosts/ hostesses for hotels/motels, house cleaners, housekeeping maids, linen room attendants, guest service clerks, establishment guides, lodging facilities attendants, recreation aides, weight reduction leaders, and entrepreneurs. Cooperative (on-the-job) education or an internship under the supervision of the instructor is an option. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of hospitality are emphasized. Teachers highlight the basic skills of math, science, and communication when appropriate in content.

Hotel/Motel Marketing MKT8160 (co-op)
Hotel/Motel Marketing MKT8161 (oe)
Grade Level: 11 or 12 (36 weeks)
In this specialized course, students with a career interest in the field of hospitality and recreation develop skills in the areas of hotel front-office procedures, human relations, food and beverage service, purchasing, tourism, travel, and sales promotion. In addition, students obtain a thorough understanding of the hotel-motel industry and the career options available. Academic skills (mathematics, science, English, and history/social science) related to the content are part of this course. Computer/technology applications supporting this course are studied.

Individual Development FCS8209
Grade Levels: 9-12 (18 weeks, single period)
Individual Development FCS8210
Grade Levels: 9-12 (36 weeks, single period)
Students enrolled in Individual Development focus on encouraging personal potential of self and others throughout the life span; enhancing positive views of self and others; managing stressful situations; formulating a plan to achieve career goals; forming healthy, caring relationships with family members and peers; managing conflict; choosing responsible ways to express oneself; and evaluating the importance of responsible parenting to individuals, families, and society. Teachers highlight basic skills of math, science, and communication when appropriate in the content.

Industrial Cooperative Training—non co-op TDI8901
Grade Level: 10
Industrial Cooperative Training I—co-op TDI8902
Grade Level: 11 or 12
Industrial Cooperative Training II—co-op TDI8903
Grade Level: 12
Prerequisite: ICT I
Industrial Cooperative Training—SIP TDI8904
Grade Level: 12
Students have the opportunity to prepare for employment related to the many fields within the areas of trade, industrial, or technical occupations. Each student receives on-the-job training and instruction related to his or her chosen trade area. The ICT SIP program can be operated as an extension of any day-trade program.

Industrial Maintenance Technology I TDI8575
Grade Level: 10 or 11
Industrial Maintenance Technology II TDI8576
Grade Level: 11 or 12
Prerequisite: IMT I
Industrial Maintenance Technology III TDI8577
Grade Level: 12
Prerequisite: IMT II
This program focuses on the adjustment, maintenance, part replacement, and repair of tools, equipment, and machines used in industry, including hydraulic and pneumatic systems.

Information Technology Fundamentals BUS6670
Grade Levels: 9, 10 (36 weeks)
Prerequisite: Keyboarding* is recommended.
Information Technology IT Fundamentals introduces the essential skills needed for students to pursue specialized programs leading to technical and professional careers and certifications in the IT industry. Students have an opportunity to investigate career opportunities in four major IT areas: Information Services and Support, Network Systems, Programming and Software Development, and Interactive Media. The focus of the IT Fundamentals course is on introducing skills related to information technology basics, Internet fundamentals, network systems, computer maintenance/upgrading/troubleshooting, computer applications, programming, graphics, Web page design, and interactive media. Students explore ethical issues related to computers and Internet technology and develop teamwork and communication skills that will enhance their employability.
*Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills

International Baccalaureate Business Management IB6135
International Baccalaureate Information Technology in a Global Society IB6613
For description, contact Virginia Department of Education, Business and Information Technology Program.

International Marketing MKT8135 (oe)
Grade Levels: 11, 12 (suggested) (36 weeks)
Prerequisites: None (We recommend that students be enrolled in a foreign language course either concurrently or prior to enrolling in this course.)
International Marketing is a specialized course for students with a career interest in the field of international trade. Students gain an understanding of the various careers in international trade, finance, shipping, and marketing and consider fundamental concepts, principles, and theories of marketing in an international setting. Course content blends macroeconomic and microeconomic theory with international culture, politics, legal issues, concepts, practices, and applications. Internships may be available to provide students with additional opportunities for "hands-on" experiences in international marketing. Academic knowledge and skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Internet Marketing MKT8125 (oe)
Grade Levels: 11, 12
Students learn about the paperless exchange of business and marketing information, using technology (i.e., Internet, e-mail, electronic data interchange, and electronic funds transfer). Included in this course is an overview of the technology of Web servers, clients, and net infrastructure and the background of this fast-growing market; the economics of electronic markets; marketing research; advertising on the Web and Web page basics; pricing information; security and encryption; and on-line business opportunities. Academic skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Interior Design I FCS8295
Grade Level: 11 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Introduction to Housing, Home Furnishings, and Design (recommended)
Students prepare for employment in the entire spectrum of home furnishings and decoration by acquiring skills that include selection, purchase, design, and decoration of home furnishings and equipment; floral design; accessory construction, and textiles and prepare for continuing education leading to a career in interior design, space planning, or interior architecture. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of interior design are emphasized. Teachers incorporate the skills of math, science, written and oral communication, and computer application when appropriate in the content.

Interior Design II FCS8296
Grade Level: 12 (36 weeks, 2 or 3 periods per day or equivalent time per week)
Prerequisite: Interior Design I (recommended)
Students engage in an in-depth extension of Interior Design I by focusing on occupational skills for workers employed as color consultants; kitchen design consultants; interior design aides; showroom assistants; furniture rental consultants; sales associates for china, silver, curtains, draperies, furniture, floor coverings, and household appliances; and residential and commercial property assistant managers. Cooperative (on-the-job) education or an internship under the supervision of the instructor is an option. Critical thinking, practical problem solving, and entrepreneurship opportunities within the field of interior design are emphasized. Teachers highlight the basic skills of math, science, and communication when appropriate in content.

Introduction to Culinary Arts FCS8249
Grade Levels: 10-12 (18 weeks, single period)
Introduction to Culinary Arts FCS8250
Grade Levels: 10-12 (36 weeks, single period)
The competencies focus on identifying and exploring the individual careers within the food service industry. Units of study include food science and technology, dietetics and nutrition services, contemporary cuisines and service styles, food and beverage production and preparation, and food safety and sanitation. Teachers highlight the basic skills of math, science, and communication when appropriate in the content.

Introduction to Early Childhood Education and Services FCS8233
Grade Levels: 10-12: (18weeks, single period)
Introduction to Early Childhood Education and Services FCS8234
Grade Levels: 10-12: (36 weeks, single period)
The child care and education competencies focus on the principles of child growth and development; development of self-concepts and building self-esteem; learning experiences for children; principles of guiding children; healthy and safe environments; career development; and careers related to child care. Teachers highlight basic skills of math, science, and communication when appropriate in the content.

Introduction to Engineering DTE8490
Grade Level: 10, 11, or 12 (36 weeks)
While undergoing an orientation to the careers and challenges of engineering, students are actively involved with high-tech devices, engineering graphics, and mathematical concepts and scientific principles through problem-solving experiences. Activities in descriptive geometry, materials science, and technical systems challenge students as they communicate information through seminars, technical reports, and idea sharing.

Introduction to Family and Human Services FCS8237
Grade Levels: 10-12 (18 weeks, single period)
Introduction to Family and Human Services FCS8238
Grade Levels: 10-12 (36 weeks, single period)
The focus of Introduction to Family and Human Services is practical problem solving, research, critical thinking, and career decision making. Professional opportunities within the cluster of health, human, and public service are identified and analyzed. Career investigation includes the areas of elder and intergenerational care services as well as family and social services. Teachers will incorporate the skills of math, science, written and oral communication, and computer applications when appropriate in the content

Introduction to Fashion Design and Marketing FCS8247
Grade Levels: 10-12 (18 weeks, single period)
Introduction to Fashion Design and Marketing FCS8248
Grade Levels: 10-12 (36 weeks, single period)
The fashion design and merchandising competencies focus on identifying and exploring the individual careers within the fashion design, manufacturing, and merchandising industry. Units of study include the relationships that exist among all areas of the clothing industry; related global and economic issues; exploration of careers in color, design, and finishing; auxiliary fashion industries; clothing maintenance, alterations, and repair; entrepreneurial opportunities in related areas; and the skills and characteristics necessary for success in careers in the textile, design, apparel production, and fashion merchandising industries. Teachers highlight the basic skills of math, science, and communication when appropriate in the content.

Introduction to Fashion Design and Marketing MKT8148/MKT8149
Grade Levels: 10, 11, 12 (18/36 weeks)
The marketing and fashion design competencies in this course focus on identifying and exploring individual careers within the fashion design, manufacturing, and marketing industry. Units of study include the relationships that exist among all areas of the clothing industry; related global and economic issues; exploration of careers in color, design, and finishing; auxiliary fashion industries; clothing maintenance, alterations, and repair; entrepreneurial opportunities in related areas; and the skills and characteristics necessary for success in careers in the textile, design, apparel production, and fashion marketing industries. Academic skills (math, science, and communication) related to the content are a part of this course.

Introduction to Health and Medical Sciences HMS8302
Grade Level: 9 or 10 (36 weeks, single period)
This course introduces the student to all health care careers and develops basic skills common to all health and medical sciences. It is recommended as the first course for the following occupational offerings: Practical Nursing I HMS8357, Nursing Assistant I HMS8360.

Introduction to Hospitality, Tourism, and Recreation FCS8258
Grade Levels: 10-12 (18 weeks, single period)
Introduction to Hospitality, Tourism, and Recreation FCS8259
Grade Levels: 10-12 (36 weeks, single period)
Students enrolled in the hospitality, tourism, and recreation core focus on hospitality operations on a system-wide basis, including both travel arrangements and promotion and the provision of traveler facilities. The program includes instruction in principles of operation of travel and tourism, hotel and lodging facilities, food services, and recreation facilities industries; hospitality marketing strategies; and industry policies and regulations. Teachers highlight the basic skills of math, science, and communications when appropriate in the content.

Introduction to Housing, Home Furnishings, and Design FCS8254
Grade Levels: 10-12 (18 weeks, single period)
Introduction to Housing, Home Furnishings, and Design FCS8255
Grade Levels: 10-12 (36 weeks, single period)
The housing, home furnishings, and design competencies focus on identifying and exploring the individual careers in all areas of housing and interior environments. Units of study include the physical and psychological aspects of environments; interior alternatives; historical, social, cultural, and geographical influences on the industry; investigation of careers in construction, real estate, home design, and home care and maintenance; identification of career options in residential and commercial interior design; store planning, institutional, and contract interior design; and the business aspects of careers related to environments. The individual characteristics and skills necessary for career success in the industry of housing and interior environments are investigated. Teachers highlight the basic skills of math, science, and communication when appropriate in the content.

Introduction to Leadership CCN9091
Grade Levels: 9-10 (18 weeks)
This course equips students with individual and group leadership skills. Course content includes leadership principles, officer training, parliamentary law, public speaking, effective communication, positive public relations skills, and techniques of organizing and conducting group meetings and activities. Students are encouraged to be active members of a community or school organization.

Introduction to Marketing MKT8111
Grade Level: 10 (18 weeks)
Students gain basic knowledge about marketing and its importance and basic skills important for entry-level marketing employment. Academic knowledge and skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Introduction to Natural Resources (III) ANR8040
Grade Level: 10 or 11 (suggested) (36 weeks)
Students develop knowledge and skills required for employment in occupations related to forestry and wildlife management; outdoor recreation; and air, soil, and water conservation. Because of the emphasis on different facets of natural resources management in different parts of the state, the course varies to meet local needs and interests.

Keyboarding BUS6150
Grade Level: 6, 7, or 8 (6/9/12/18 weeks)
This course is designed for middle school students to develop and enhance touch skills for entering alphabetic, numeric, and symbol information on a keyboard. Students compose and produce personal, educational, and professional documents.

Keyboarding BUS6151
Grade Levels: 9, 10, 11, 12 (18 weeks)
This course is designed for secondary school students to develop and enhance touch skills for entering alphabetic, numeric, and symbol information on a keyboard. Students compose and produce personal, educational, and professional documents. (Students who can demonstrate touch keyboarding skills may test out and enter into the applications semester—BUS6153—to develop document preparation skills.)

Keyboarding Applications BUS6152
Grade Levels: 9, 10, 11, 12 (36 weeks)
This course is designed for secondary school students to develop and enhance touch skills for entering alphabetic, numeric, and symbol information on a keyboard. Students compose and produce a variety of personal, educational, and professional documents.

Keyboarding Applications BUS6153
Grade Levels: 9, 10, 11, 12 (18 weeks)
Prerequisite: Keyboarding (BUS6150 or BUS6151)*
Students enhance touch skills for entering alphabetic, numeric, and symbol information on a keyboard. Students compose and produce a variety of personal, educational, and professional documents. (Students may enroll in this applications semester—6153—after successful completion of previous keyboarding coursework or a documented performance test/record of 6150 or 6151 competencies.)
*Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills

Landscaping ANR8036
Grade Level: 11 or 12 suggested (36 weeks)
Prerequisite: Horticulture Sciences
In this course, students develop the necessary knowledge, skills, habits, and attitudes for entry-level employment and advancement in areas such as landscape design, landscape construction, and landscape maintenance. They receive instruction in sketching and drawing, analyzing a landscape site, designing for function and aesthetics, identifying and selecting landscape plants, purchasing and installing plants, and maintaining the landscape by watering, fertilizing, mulching, pruning, and controlling pests.

Leadership Development CCN9092
Grade Levels: 11-12 (18 to 36 weeks)
Students develop competencies in identifying individual aptitudes in relation to effective leadership skills, understanding organizational behavior, using effective communication in the workplace, handling human resources and organizational problems, supervising and training employees, resolving conflict, and planning for the future. Continuing education in leadership is emphasized as well as practical leadership experiences in cooperation with school and community leaders.

Legal Systems Administration BUS6735
Grade Levels: 11, 12 (36 weeks)
Legal Systems Administration BUS6736
Grade Levels: 11, 12 (18 weeks)
Prerequisites: Keyboarding Applications*
Students completing Office Administration and wishing to gain employment in the legal field may take this course to learn how to use legal terminology and procedures useful in preparing legal documents and functioning effectively in a law office. When this course is offered as a daily multiple-period class, the competencies identified in the Office Administration course may be included. Completion of this course, when combined with Accounting and Office Administration, may prepare students for the certification exam for Accredited Legal Professional. Completion may also lead to MOS certification.
*Keyboarding course(s) or teacher approved demonstrated and documented touch keyboarding skills

Life Planning FCS8226
Grade Levels: 9-12 (18 weeks, single period)
Life Planning FCS8227
Grade Levels: 9-12 (36 weeks, single period)
Students enrolled in Life Planning focus on developing a life management plan; caring for self and others to ensure wellness; building and maintaining constructive relationships; building and maintaining strong, functional families; developing strategies for lifelong career planning; coordinating personal and career responsibilities; and establishing a plan for using resources. Teachers highlight the basic skills of math, science, and communication when appropriate in the content.

Make It Your Business BUS6110
Grade Levels: 6, 7, 8, 9 (6/9/12 weeks)
Make It Your Business BUS6111
Grade Levels: 6, 7, 8, 9 (18 weeks)
Students are provided opportunities to run a small group or class business based on their own design for providing a service or product needed at their school. Students learn business terminology, basic entrepreneurship concepts, and fundamental business operating principles in this course. Design of course content provides for interdisciplinary instruction.

Make It Your Business MKT8109
Grade Levels: 6, 7, 8, 9 (6 weeks)
Make It Your Business MKT8112
Grade Levels: 6, 7, 8, 9 (9 weeks)
Make It Your Business MKT8113
Grade Levels: 6, 7, 8, 9 (12 weeks)
Make It Your Business MKT8114
Grade Levels: 6, 7, 8, 9 (18 weeks)
Students are provided opportunities to run a small group or class business based on their own design for providing a service or product needed at their school. They learn business terminology, basic entrepreneurship concepts, and fundamental business operating principles in this course. Design of course content allows for interdisciplinary instruction. Academic knowledge and skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Manufacturing Systems DTE8425
Grade Level: 10, 11, or 12 (36 weeks)
Manufacturing Systems DTE8426
Grade Level: 10, 11, or 12 (18 weeks)
This course provides an orientation to careers in various fields of manufacturing. Emphasis will be placed on the major systems in automated manufacturing, including design, electrical, mechanical, manufacturing processes, material handling, and quality control. Students participate in teams and produce manufacturing projects that demonstrate critical elements of manufacturing.

Marketing MKT8120 (co-op)
Marketing MKT8121 (oe)
Grade Levels: 11, 12 (36 weeks)
Students are introduced to functions and foundations involved in the marketing of goods, services, and ideas and achieve skills necessary for successful marketing employment. Students study risk management, selling, promotion, pricing, purchasing, marketing-information management, product/service planning, distribution, and financing. Foundation skills include economics, human resources, and marketing and business necessary for success in marketing occupations. Academic skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Marketing Dual Enrollment with Postsecondary MKT8198
For information, please contact the Marketing Program Specialist, Virginia Department of Education.

Marketing Management MKT8132 (oe)
Grade Level: 12 (suggested) (36 weeks)
High school seniors who plan to attend college with a concentration in marketing, business, or management and/or who have tentative plans to manage or own a business will benefit from this course. Students develop critical thinking and decision-making skills through the application of marketing principles to (a) small and large businesses, (b) nonprofit organizations, (c) the professions, (d) service industries, and (e) other institutions or associations that market products, services, ideas, or people. Academic knowledge and skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/ technology applications supporting this course are studied.

Masonry I TDI8512
Grade Level: 10 or 11
Masonry II TDI8513
Grade Level: 11 or 12
Prerequisite: Masonry I
Masonry III TDI8514
Grade Level: 12
Prerequisite: Masonry II
Students learn to use hand tools such as trowels, levels, and chisels and power tools such as concrete mixers to lay brick, concrete block, tile, and related materials.

Materials and Processes Technology DTE8433
Grade Level: 9, 10, or 11 (36 weeks)
Materials and Processes Technology DTE8478
Grade Level: 9, 10, or 11 (18 weeks)
Students focus on industrial/technical materials and processes as they fabricate usable products and conduct experiments. Learning experiences include career analysis as well as the use of tools and equipment related to analysis, testing, and processing of metals, plastics, woods, ceramics, and composite materials. This single-period laboratory course is recommended for students interested in technical careers and others wishing to improve their consumer knowledge and technological literacy.

Medical Assistant I HMS8345
Grade Level: 11 (suggested) (36 weeks, double-period)
Prerequisites: None—Introduction to Health and Medical Sciences is strongly recommended.
Students develop basic skills and techniques to assist the physician in the following areas: receptionist duties, patient examinations, cardio-pulmonary resuscitation, and simple laboratory tests. On-the-job clinical instruction may occur in physicians' offices or clinics and is coordinated by the Health and Medical Sciences teacher.

Medical Assistant II HMS8346
Grade Level: 12 (suggested) (36 weeks, triple period)
Prerequisites: Medical Assistant I
Students further develop medical-assisting skills and techniques learned in Medical Assistant I. They also learn medical economics; assembly and maintenance of patient records; care of equipment; special diagnostic testing such as EKG, visual, and audio testing machines; and assistance with office therapy. Advanced on-the-job clinical experience in physicians' offices or clinics is a part of the course. Successful completion of the program leads to employment in physicians' offices or clinics. Keyboarding is recommended.

Medical Systems Administration BUS6730
Grade Levels: 11, 12 (36 weeks)
Medical Systems Administration BUS6731
Grade Levels: 11, 12 (18 weeks)
Prerequisites: Keyboarding Applications*
Students completing Office Administration and wishing to gain employment in the medical field may take this course to learn how to use medical terminology and procedures useful in developing medical documents and functioning effectively in a medical office environment. When this course is offered as a daily multiple-period class, the competencies identified in the Office Administration course may be included.
*Keyboarding course(s) or teacher approved demonstrated and documented touch keyboarding skills

Medical Terminology HMS8383
Grade Levels: 10-12 (18 weeks)
Prerequisite: None —Introduction to Health and Medical Sciences is strongly recommended.
Medical Terminology is designed to help students learn health care language and is presented in logical order, beginning with each body system's anatomy and physiology and progressing through pathology, diagnostic procedures, therapeutic interventions, and finally pharmacology. Concepts, terms, and abbreviations for a topic are also presented to the students.

Nail Technician I TDI8692
Grade Level: 10 or 11
Nail Technician II TDI8693
Grade Level: 11 or 12
Prerequisite: Nail Technician I
Students learn to manicure, pedicure, install and maintain artificial nails, and apply concepts associated with bacteriology, sanitation, nail disorders, anatomy and physiology, and safety. The course requires a minimum of 540 hours. Completion prepares students for the Virginia state licensing examination in Nail Technician.

Natural Resources Business Management (V) ANR8044
Grade Level: 12 (suggested) (36 weeks)
Much of the instruction in this course may be individualized. Major learning areas include processing forest products, lumber grading, and determining the feasibility of establishing, financing, and managing a business such as forestry, outdoor recreation, wildlife, or urban conservation. Based upon interests, students may receive instruction in developing and operating campgrounds, hiking and riding trails, riding stables, marinas, vacation farms, and farm ponds. Operation and maintenance of equipment is also emphasized. Leadership training is an important area of instruction.

Notetaking BUS6241
Grade Levels: 9, 10, 11, 12 (36 weeks)
Notetaking BUS6242
Grade Levels: 9, 10, 11, 12 (18 weeks)
Prerequisite: Keyboarding* recommended
Students learn an easy, abbreviated writing system of notetaking that enables them to take and transcribe notes for educational, business, or personal use. Students explore reasons for taking notes, ways to listen effectively, and strategies for improving communication and study skills for academic success.
*Keyboarding course(s) or teacher approved demonstrated and documented touch keyboarding skills

Nursing Assistant I HMS8360
Grade Level: 11 or 12 (36 weeks)
Prerequisites: None —Introduction to Health and Medical Sciences is strongly recommended.
Nursing Assistant I, offered as a single-, double-, or triple-period occupational preparation course at the 11th-grade level, emphasizes the study of nursing occupations as related to the health care system. Students study normal growth and development, simple body structure and function, and medical terminology and are introduced to microbes and disease. They receive elementary skill training in patient-nurse's assistant relationships; taking and recording of vital signs; cardiopulmonary resuscitation; and bathing, feeding, dressing, and transporting of patients in hospitals and nursing homes. Limited on-the-job instruction in nursing homes and hospitals is part of the course. This course can be used as an introduction to practical nursing or to prepare the student for Nursing Assistant II so that all competencies for a certified nursing assistant are met.

Nursing Assistant II HMS8362
Grade Level: 12 (suggested)(36 weeks)
Prerequisites: Nursing Assistant I
Nursing Assistant II is a double-or triple-period occupational preparation course, emphasizing advanced skill training in areas such as catheter care, range of motion, bowel and bladder training, care of the dying, selected procedures for maternal and infant care, and admission and discharge procedures. Students learn diseases and body systems as related to advanced clinical care of the acute medical-surgical patient, the chronically ill, and the elderly. On-the-job instruction in a licensed nursing home is part of the course. Upon completion of the nurse's assistant program, the student is eligible to take the nursing assistant certification exam that leads to employment as a certified nursing assistant in hospitals and nursing homes.

Nutrition and Wellness FCS8228
Grade Levels: 9-12 (18 weeks, single period)
Nutrition and Wellness FCS8229
Grade Levels: 9-12 (36 weeks, single period)
Students enrolled in Nutrition and Wellness focus on making choices that promote wellness and good health; analyzing relationships between psychological and social needs and food choices; choosing foods that promote wellness; obtaining and storing food for self and family; preparing and serving nutritious meals and snacks; selecting and using equipment for food preparation; and identifying strategies to promote optimal nutrition and wellness of society. Teachers highlight the basic skills of math, science, and communication when appropriate in the content.

Office Administration BUS6621
Grade Level: 10, 11, 12 (36 weeks)
Office Administration BUS6622
Grade Level: 10, 11, 12 (18 weeks)
Prerequisite: Keyboarding*
Students enhance word processing and communication skills as they develop competencies needed by administrative support professionals. Students study office procedures such as information processing, telecommunications, electronic record management, and financial records management.
*Keyboarding course(s) or teacher approved demonstrated and documented touch keyboarding skills

Office Specialist I BUS6740 (Targeted Populations)
Grade Levels: 9, 10, 11, 12 (36 weeks)
Office Specialist II BUS6741 (Targeted Populations)
Grade Levels: 10, 11, 12 (36 weeks)
Office Specialist III BUS6742 (Targeted Populations)
Grade Levels: 11, 12 (36 weeks)
Students complete the Office Specialist sequence identified locally or progress in the sequence until prepared to transfer into other business courses. Students develop skills in areas including keyboarding, word processing, office procedures, and records management. If a fourth year is needed, the teacher should use simulated activities in the following areas: word processing, spreadsheets, databases, telecommunications, desktop publishing, and records management.

Operating the Farm Business (V) ANR8014
Grade Level: 12 (suggested) (36 weeks)
Much of the content in this occupational preparation course may be provided through individualized instruction. Students focus on farming, farm management, and occupational experience as they receive instruction in adjusting, operating, and maintaining farm machinery and equipment and in planning and constructing farm buildings and facilities. Continued emphasis is placed on leadership training.

Parenting FCS8231
Grade Levels: 9-12 (18 weeks, single period)
Parenting FCS8232
Grade Levels: 9-12 (36 weeks, single period)
Students enrolled in Parenting focus on assessing the impact of the parenting role in society; taking responsibility for individual growth within the parenting role; preparing for a healthy emotional and physical beginning for parent and child; meeting developmental needs of children and adolescents; building positive parent-child relationships; using positive guidance and discipline to promote self-discipline, self-respect, and
socially responsible behavior; obtaining parenting information, support, and assistance; and planning ways that families and society can share in nurturing children and adolescents. Teachers highlight the basic skills of math, science, and communication when appropriate in the content.

Pharmacy Technician (8305)
Grade Levels: 11 or 12
The certificate program is designed to provide students the basic skills and knowledge to begin work as a Pharmacy Technician. The coursework will fulfill the requirements of the Board of Pharmacy and prepare students to take either the state examination or the national examination administered by the Pharmacy Technician Certification Board. Trained, experienced pharmacy technicians who can demonstrate the right skills and knowledge should be able to pursue many exciting and respected career options or postsecondary study in the field of pharmacy.

Physical/Occupational Therapy HMS8385
Grade Level: 11 or 12 (36 weeks, 1 or 2 class periods for 1 or 2 credits)
Prerequisites: Algebra, Biology
The course is designed to provide an introduction to the professions of physical and occupational therapy. Students explore the principles and practices of therapists in the health care industry and participate in a clinical internship under the direct supervision of a licensed physical and/or occupational therapist. Clinical skills in the areas of physical therapy and occupational therapy will enable students to gain experience in rehabilitative care, which is practiced throughout the continuum of care and across the life span of individuals. After successful completion of this course, students will be prepared for employment as rehabilitation technicians or may seek higher education for specific degrees in a variety of fields such as physical therapy, occupational therapy, speech therapy, sports medicine, athletic training, chiropractic medicine, biology, or exercise physiology.

Plumbing I TDI8551
Grade Level: 10 or 11
Plumbing II TDI8552
Grade Level: 11 or 12
Prerequisite: Plumbing I
Plumbing III TDI8553
Grade Level: 12
Prerequisite: Plumbing II
Students learn to assemble, install, and repair pipes, fittings, and fixtures of heating, water, and drainage systems, according to specification and plumbing codes.

Power and Transportation DTE8445
Grade Level: 9, 10, or 11 (36 weeks)
Power and Transportation DTE8444
Grade Level: 9, 10, or 11 (18 weeks)
Students survey the many broad sources of energy and power used in power and transportation systems. Instruction in this single-period course includes ways that (1) energy is converted to power; (2) power is transmitted and controlled; and (3) power is used through mechanical, fluid, and electrical devices. Students explore career opportunities in power and transportation fields and build projects, conduct experiments, and repair mechanical devices such as small engines, electrical motors, and outboard motors.

Practical Nursing I HMS8357
Grade Level: 11 (suggested)(18 weeks)
Prerequisites: None—Introduction to Health and Medical Sciences is strongly recommended.
Students learn nursing care of patients of all ages, in various stages of sickness or wellness, and with a variety of disease conditions. They focus on human anatomy, body function, communication, community health, introduction to fundamental nursing skills, nutrition, drug therapy, and elementary medical-surgical nursing.

Practical Nursing II HMS8358
Grade Level: 12 (18 weeks)
Prerequisites: Practical Nursing I
Instruction emphasizes introduction into pharmacology, normal life span (human growth and development), normal nutrition, nursing fundamentals, and nursing trends. Advanced emergency procedures and application of nursing procedures are demonstrated in a laboratory setting.

Practical Nursing III HMS8359
Grade Level: Adult, 13 (36 weeks, full-time)
Prerequisite: Practical Nursing II
Classroom and clinical training are given in approved hospitals, licensed nursing homes, or home-care settings under the direction of a nurse educator. Instruction emphasizes administration of medicines, advanced and complex patient care, and practice with patients of all ages. Students learn advanced anatomy, physiology, and human behavior as related to health and disease, including mental illness. Upon successful completion of the total program, students qualify to take the practical nurse licensing examination.

Precision Machining Technology I TDI8539
Grade Level: 10 or 11
Precision Machining Technology II TDI8540
Grade Level: 11 or 12
Prerequisite: PMT I
Precision Machining Technology III TDI8541
Grade Level: 12
Prerequisite: PMT II
Students learn the basics of industrial safety and environmental protection; planning, management, and performance of machining jobs; quality control; process improvement; general maintenance; engineering drawings and sketches; and application of measurements, metalworking theory, properties of materials, and principles of CNC. Precision Machining Technology programs may be certified by NTMA (National Tooling and Machining Association), the certifying agency for the National Institute for Metalworking Skills (NIMS). See Precision Machining Technology Framework for additional information.

Principles of Business and Marketing BUS6115
Grade Levels: 9, 10 (36 weeks)
Principles of Business and Marketing BUS6116
Grade Levels: 9, 10 (18 weeks)
Students explore the roles of business and marketing in the free enterprise system and the global economy. Students study how the American economy operates and prepare to make decisions as consumers, wage earners, and citizens.

Principles of Business and Marketing MKT8115
Grade Levels: 9, 10 (36 weeks)
Principles of Business and Marketing MKT8116
Grade Levels: 9, 10 (18 weeks)
Students explore the roles of business and marketing in the free enterprise system and the global economy. Students study how the American economy operates and prepare to make decisions as consumers, wage earners, and citizens.

Principles of Technology I DTE9811
Grade Level: 10, 11, or 12 (36 weeks)
Students in this single-period laboratory science course apply physics and mathematics concepts through a unified systems approach to develop a broad knowledge base of the principles underlying modern technical systems. Students study seven technical principles: force, work, rate, resistance, energy, power, and force transformers, emphasizing how each principle plays a unifying role in the operation of mechanical, fluid, electrical, and thermal systems in high-technology equipment. This "principles and systems" approach to studying these technical principles provides a foundation for further education and career flexibility as technology and technical systems advance.

Principles of Technology II DTE9812
Grade Level: 11 or 12 (36 weeks)
Prerequisite: Principles of Technology I (36 weeks)
Students continue to apply physics and mathematics concepts through a unified systems approach to expand their knowledge base of the principles underlying modern technical systems. This course focuses on seven technical principles: momentum, waves, energy converters, transducers, radiation, optical systems, and time constants, emphasizing how each principle plays a unifying role in the operation of mechanical, fluid, electrical, and thermal systems in high-technology equipment. This "principles and systems" approach to studying these technical principles provides a foundation for further education and career flexibility as technology and technical systems advance.

Students who complete Principles of Technology I (9811) and Principles of Technology II (9812) may use these courses to satisfy one (1) physics credit in laboratory science. A student must complete both courses in the sequence in order to receive laboratory science credit. The sequence of Principles of Technology I (9811) and Principles of Technology II (9812) will satisfy one (1) unit of credit in laboratory science for physics and one (1) elective credit. Students who enroll in Principles of Technology courses for a physics credit must have completed Algebra I and two (2) other laboratory science courses as specified by the accrediting standards prior to enrolling in Principles of Technology.

Production Systems DTE8447
Grade Level: 9, 10, or 11 (36 weeks)
Production Systems DTE8446
Grade Level: 9, 10, or 11 (18 weeks)
Students plan, design, develop, and market products, using technology such as computer-aided manufacturing (CAM), computer numerical control (CNC), and robots used in flexible manufacturing systems. They analyze markets, design and develop prototypes, determine impact, and plan new businesses needed by people and society. Students consider the social, cultural, and economic impacts of automation. The class determines major production systems employed by local industries.

Programming BUS6640
Grade Levels: 10, 11, 12 (36 weeks)
Prerequisite: Keyboarding* and Information Technology Fundamentals are recommended.
Students explore computer concepts, use logic procedures, and implement programming procedures using one or more programming languages, such as Visual Basic, Java, and C++. In addition, HTML or JavaScripting is used to program Web pages.
*Keyboarding course(s) or teacher approved demonstrated and documented touch keyboarding skills

Public Safety I TDI8700
Grade Level: 11 or 12
Public Safety II TDI8701
Grade Level: 12
Prerequisite: Public Safety I
Students learn basic procedures related to law enforcement and fire fighting occupations, including emergency medical services, traffic control, safety, crowd control, and fire prevention technology. The course requires a minimum of 540 hours.

Radio Communications I TDI8640
Grade Level: 10 or 11
Radio Communications II TDI8641
Grade Level: 11 or 12
Prerequisite: Radio Communications I
Radio Communications III TDI8642
Grade Level: 12
Prerequisite: Radio Communications II
Students learn basic electricity and electronics, including all aspects of safety as well as related mathematics. Activities provide the skills for obtaining a radio-telephone operator license. Students learn practices related to the management and operation of a broadcasting station.

Real Estate Marketing MKT8191 (oe)
Grade Level: 12 (suggested) (36 weeks)
Students gain skills related to sales, real estate financing, ownership rights, investments, ethics, and 60 hours of Real Estate Principles (requirements for admission to the Virginia Real Estate exam). Upon successful completion of the course, taught by an instructor approved by the Marketing Service and the Virginia Real Estate Commission, students are eligible to take the Virginia real estate licensing exam.

Resource Management FCS8214
Grade Level: 9-12 (18 weeks, single period)
Resource Management FCS8219
Grade Level: 9-12 (36 weeks, single period)
Students enrolled in Resource Management focus on managing resources to achieve individual goals; making informed consumer choices; creating and maintaining a living environment that supports the well-being of individuals; living in a global environment; making decisions related to nutrition, clothing, and housing; and managing a household. Teachers highlight the basic skills of math, science, and communication when appropriate in the content.

Robotic Workcell Technology I TDI8557
Grade Level: 10 or 11
Robotic Workcell Technology II TDI8558
Grade Level: 11 or 12
Prerequisite: Robotic Workcell Technology **I**
Robotic Workcell Technology III TDI8559
Grade Level: 12
Prerequisite: Robotic Workcell Technology II
This course provides instruction in basic computer programming, electronics, motor control, and feedback systems used in assembly and manufacturing settings. In addition, students learn how to program programmable logic controllers for remote robotic manipulation.

Sheet Metal I TDI8663
Grade Level: 10 or 11
Sheet Metal II TDI8664
Grade Level: 11 or 12
Prerequisite: Sheet Metal I
Sheet Metal III TDI8665
Grade Level: 12
Prerequisite: Sheet Metal II
Students work with materials that are cast, formed, shaped, molded, heat treated, cut, twisted, pressed, fused, or stamped. Instruction includes the planning, manufacturing, assembling, testing, and repairing of mechanisms, machines, and structures.

Small Animal Care I ANR8083
Grade Levels: 8-12 (18/36 weeks)
Small Animal Care II ANR8084
Grade Levels: 8-12 (18/36 weeks)
Students learn how to care and manage small animals, focusing on instructional areas in animal health, nutrition, management, reproduction, evaluation, training, and, when applicable, showmanship. Course content also includes instruction in the tools, equipment, and facilities for small animal care and provides activities to foster business management and leadership development. FFA activities are included.

Small Engine Repair ANR8021
Grade Levels: 9-12 (18 weeks)
Small Engine Repair ANR8082
Grade Levels: 9-12 (36 weeks)
This course offers an intensive study of the operation, maintenance, and repair of small gasoline and diesel engines. Instructional topics include principles of operation of gasoline and diesel engines, tune-up and maintenance procedures, and disassembly, overhaul, and reassembly. Instruction may also include the operation of two cycle and four-cycle engines commonly found on lawn mowers, garden tractors, snow blowers, rotary tillers, chainsaws, and other equipment. The course emphasizes leadership activities and opportunities to participate in FFA functions. Completion of this course may prepare students for Outdoor Power Equipment Certification exams.

Small Engine Repair I TDI8725
Grade Level: 10 or 11
Small Engine Repair II TDI8726
Grade Level: 11 or 12
Prerequisite: Small Engine Repair I
Small Engine Repair III TDI8727
Grade Level: 12
Prerequisite: Small Engine Repair II
Students learn to maintain and repair small internal-combustion engines used on portable power equipment such as lawnmowers, chain saws, rotary tillers, motorcycles, and snowmobiles, and other 2- and 4 cycle engines.

Specialty Horticulture Arts ANR8037
Grade Level: 11 or 12 (suggested
Prerequisite: Horticultural Sciences (ANR8034)
This course covers a wide range of specialty topics, including topiary, fruit and vegetable production, interior plantscaping, terrariums, dish gardens, bonsai, container gardens, heirloom plants, container water gardens, bulb forcing, and hydroponics. Further study is devoted to gardens that are centered on such themes as healing, wildlife, fragrance, and handicapped accessibility. Entrepreneurial business and continuing education opportunities are also addressed. The course emphasizes leadership activities and opportunities for participate in FFA events.

Sports, Entertainment, and Recreation Marketing MKT8175 (co-op)
Sports, Entertainment, and Recreation Marketing MKT8176 (oe)
Grade Levels: 10, 11, 12 (36 weeks)
Students develop skills in the areas of marketing analysis, event marketing, communication, and human relations, along with a thorough understanding of the sports, entertainment, and recreation industry and career options available. Academic skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Surgical Technologist I HMS8351
Grade Level: 12 (36 weeks, triple period)
Prerequisites: None—Introduction to Health and Medical Sciences or Nursing Assistant I is recommended.
Students acquire knowledge and assisting skills to function in association with licensed nurses and surgeons/physicians, providing the best possible care of the surgical patient. Instruction emphasizes human anatomy, medical terminology, cleanliness, asepsis, safety, and efficiency in the operating room.

Surgical Technologist II HMS8352
Grade Level: Adult, 13 (suggested) (4 months, full-time)
Prerequisites: Surgical Technologist I
Classroom and clinical training are given in selected approved hospitals under the direction of a nurse educator. Students learn operating room procedures and aseptic surgical techniques, including preparation and handling of materials and surgical instruments at the operating table. Upon successful completion of the program, students qualify to take the national certification exam.

Teacher Cadet CCN9062
Grade Level: 12 (36 weeks)
The Teacher Cadet course introduces seniors to a career in teaching and education. The primary elements of the curriculum components are *the learner, the school*, and *the teacher and teaching*. The components are intentionally broad in scope and provide a great deal of flexibility based on the career interest of a student. In addition to the fundamental curriculum components, all students are required to participate in an internship outside the teacher cadet classroom. The internship may involve the pre-school level through grade 12.

Technical Drawing/Design DTE8435
Grade Level: 9, 10, or 11 (36 weeks)
Technical Drawing/Design DTE8434
Grade Level: 9, 10, or 11 (18 weeks)
In this foundation course students learn the basic language of technical design, and they design, sketch, and make technical drawings, models, or prototypes of real design problems. The course is especially recommended for future engineering and architecture students.

Technology Assessment DTE8407
Grade Level: 11 or 12 (36 weeks)
Technology Assessment DTE8406
Grade Level: 11 or 12 (18 weeks)
Prerequisite: Technology Transfer
Technology Assessment is offered as a capstone course for students in high school. Students use their knowledge and abilities in math, science, and technology to analyze the contributions of technical devices to their homes and the world. Students use information they acquire through library research or computer databases to predict the future. They design futuristic products and use assessment to determine possible results. They also use computer graphics, videotapes, and design portfolios to present their newly created products and systems.

Technology Education Dual Enrollment with Postsecondary DTE8498
For information, please contact the Technology Education Service, Virginia Department of Education.

Technology Foundations DTE8403
Grade Level: 9, 10, 11, or 12 (36 weeks)
Technology Foundations DTE8402
Grade Level: 9, 10, 11, or 12 (18 weeks)
In the beginning high school course in the Design and Technology program, students acquire a foundation in technological material, energy, and information and apply processes associated with the technological thinker. Challenged by laboratory activities, students create new ideas and innovations, build systems, and analyze technological products to learn further how and why technology works. They work in groups to build and control systems with engineering in the development of a technology.

Technology Transfer DTE8405
Grade Level: 10, 11, or 12 (36 weeks)
Technology Transfer DTE8404
Grade Level: 10, 11, or 12 (18 weeks)
Prerequisite: Technology Foundations
Students work with a variety of computers, materials, and systems to improve their skills and knowledge. Groups work together, applying math, science, and communication concepts, on a project that combines systems such as production, energy, communication, transportation, biotechnology, and other technologies. Thematic activities engage students in community problems where they transfer the technological method to address recycling, space exploration, and housing.

Telecommunications I TDI8650
Grade Level: 10 or 11
Telecommunications II TDI8651
Grade Level: 11 or 12
Description is under development. Course information is available from Trade and Industrial Education, Virginia Department of Education.

Television Production I TDI8688
Grade Level: 10 or 11
Television Production II TDI8689
Grade Level: 11 or 12
Prerequisite: Television Production I
Television Production III TDI8690
Grade Level: 12
Prerequisite: Television Production II
Students learn to operate equipment such as TV cameras, video tape recorders, microphones, audio mixers, and audio/video editing systems. They practice skills related to production, direction, and scripting of programs and set design and construction. Students also study control room procedures and responsibilities.

Trade and Industrial Education Dual Enrollment with Postsecondary TDI8801
Information is available from the Trade and Industrial Education Service, Virginia Department of Education.

Travel and Tourism Marketing MKT8165 (co-op)
Travel and Tourism Marketing MKT8166 (oe)
Grade Level: 11 or 12 (36 weeks)
Students develop skills in the areas of communication, human relations, mathematics, creative selling, sales promotion, industry technology, and market research. They learn computerized systems used by major airlines and travel agencies. In addition, students obtain a thorough understanding of the travel and tourism industry and the career options available. Academic skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

Turf Establishment and Maintenance ANR8051
Grade Level: 11 (suggested) (36 weeks)
Students begin to master the duties and tasks of professionals who establish and maintain turf in public areas such as golf courses; parks; athletic fields; school, industrial, and institutional campuses; and residential lawns.

Utility/Heavy Construction Technology I TDI8616
Grade Level: 10 or 11
Utility/Heavy Construction Technology II TDI8617
Grade Level: 11 or 12
Prerequisite: Utility/Heavy Construction Technology I
Utility/Heavy Construction Technology III TDI8618
Grade Level: 12
Prerequisite: Utility/Heavy Construction Technology II
This program provides both the knowledge and the hands-on skills needed to secure a job as a construction equipment operator. Students learn about site grading and development, excavation, concrete structures, pipe laying, road building, and other topics. They have the opportunity to gain experience in operating excavators, bulldozers, loaders, and motor graders. Completion of this sequence may prepare students for the certification exam for medium/heavy truck technician or parts specialist.

Veterinary Assistant Level I HMS8310
Grade Levels: 10-12 (36 weeks, double or triple period)
Prerequisites: None—Introduction to Health and Medical Sciences is strongly recommended.
Students learn animal science and the care of animals, including animal structure and function, principles of health, and microbes and disease. They develop basic skills and techniques of assisting the veterinarian in the following areas: receptionist duties; animal examinations; examining room and laboratory work; the handling, caring, and feeding of animals; first aid and surgery; and maintenance of equipment and facilities. On-the-job clinical instruction may occur in veterinary offices or animal clinics and is coordinated by the health and medical sciences teacher.

Veterinary Assistant Level II HMS8311
Grade Levels: 11-12 (36 weeks, double or triple period)
Prerequisites: Veterinary Assistant (Level I)
The student may incorporate a cooperative work experience that combines classroom instruction with two or three hours of school-released time for on-the-job training in a health care facility such as a veterinarian's office or clinic.

Veterinary Assistant Level III HMS8312
Grade Level: 12 (36 weeks, double or triple period)
Prerequisites: Veterinary Assistant Level I and Level II
The student will incorporate advanced classroom instruction with two or three hours of release time for on-the-job experience.

Welding I TDI8672
Grade Level: 10 or 11
Welding II TDI8673
Grade Level: 11 or 12
Prerequisite: Welding I
Welding III TDI8674
Grade Level: 12
Prerequisite: Welding II
Students learn to use gases and/or welding processes and to braze and solder metal parts according to diagrams, blueprints, or written specifications.

Word Processing BUS6625
Grade Levels 9, 10, 11, 12 (36 weeks)
Word Processing BUS6626
Grade Levels: 9, 10, 11, 12 (18 weeks)
**Prerequisite:** Keyboarding*
Students develop intermediate to advanced level word processing skills using a variety of software functions, including graphics, desktop publishing, and telecommunications. Students gain competence integrating other applications such as database and spreadsheet into word processing activities. Classroom experiences also provide for skill development in communication.
*Keyboarding course(s) or teacher approved demonstrated and documented touch keyboarding skills

Work and Family Management FCS8205/FCS8282
Grade Levels: 10-12 (18/36 weeks, single period)
The work and family management course focuses on balancing the multiple demands of career, family, and personal life; the interpersonal skills needed to build strong relationships in the family and the workplace; and conflict management, problem solving, goal setting, stress management, and resource management in work and family. Honors credit is available as a local option. Teachers will incorporate the skills of math, science, written and verbal communication, and computer applications when appropriate in the content.
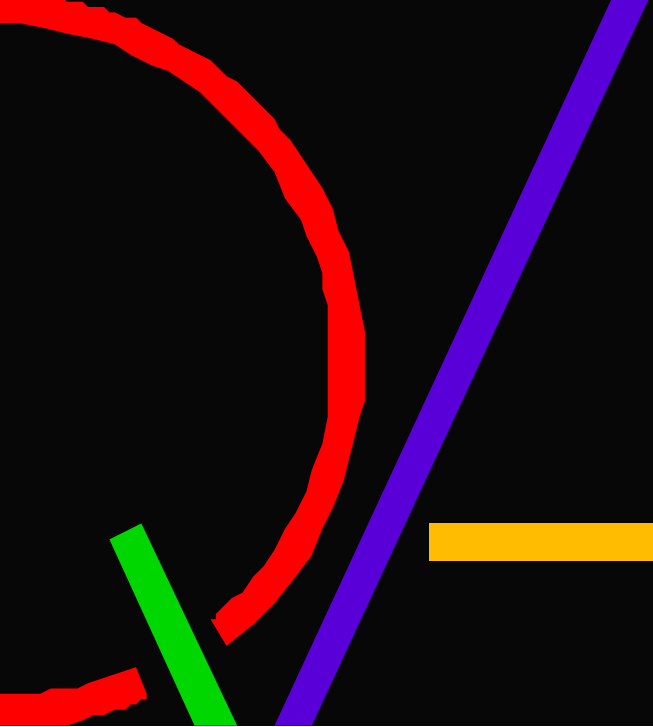
Section 3: Course Sequences

Section 3 spells out approved course sequences that complete a concentration or specialization.

Definitions applicable to sequences include the following:

> A *concentration* is a coherent sequence of courses completed by a student in a specific career area as identified in this planning guide.
>
> A *specialization* is a choice by a student to specialize in an occupational field by taking additional courses in a specific career area as identified in this planning guide.
>
> A career and technical education *completer* is a student who has met the requirements for a career and technical concentration or specialization and all requirements for high school graduation or an approved alternative education program..

Again, you will find course titles listed in alphabetical order. Almost all courses are presented as part of a concentration sequence, and some are listed as part of a specialization sequence. (In most cases, a concentration is equivalent in credit to two 36-week courses, and a specialization is equivalent to three 36-week courses.)

If you are interested in an advanced course, you will see a reference to the beginning course in the sequence. For example, beside Advanced Accounting is the note, "See Accounting BUS6320," and beside Forestry, Wildlife, and Soil Management ANR8042 is the note, "See Introduction to Natural Resources ANR8040."

Section 3: Course Sequences

Course/Course Code	Concentration Sequences	Specialization Sequences
Accounting BUS6320 **Prerequisite:** Keyboarding* is recommended. *Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	Accounting BUS6320 **and** a combination of one or more of the following 18-week or 36-week courses, equivalent to a total of two 36-week courses: • Advanced Accounting BUS6321 • Business Law BUS6131/BUS6132* • Business Management BUS6135/BUS6136* • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/ BUS6614* • Advanced Computer Information Systems BUS6613/ BUS6615* (requires CIS prerequisite) • Finance BUS6120/BUS6121* • Desktop/Multimedia Presentations BUS6630/ BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/BUS6633* (requires Desktop Multimedia Presentations prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Keyboarding Applications BUS6152/6153* • Keyboarding BUS6151* • Medical Systems Administration BUS6730/BUS6731* • Legal Systems Administration BUS6735/BUS6736* • Notetaking BUS6241/BUS6242* (may complement sequence but must be offered with two or more other courses) • Office Administration BUS6621/BUS6622* • Principles of Business and Marketing BUS6115/ BUS6116* • Word Processing BUS6625/BUS6626* *18-week course*	Accounting BUS6320 **and** a combination of one or more 18-week **and** 36-week courses listed for concentration, equivalent to a total of three 36-week courses
Advanced Accounting BUS6321	See Accounting BUS6320	
Advanced Agricultural Mechanization ANR8020	See Agricultural Power and Equipment ANR8016	
Advanced Computer Information Systems BUS6613/BUS6615	See Computer Information Systems BUS6612/BUS6614	
Advanced Computer Network Software Operations BUS6651	See Computer Network Software Operations BUS6650	
Advanced Database Design and Management (Oracle) BUS6661	See Database Design and Management (Oracle) BUS6660	
Advanced Desktop/Multimedia Presentations BUS6631/BUS6633	See Desktop/Multimedia Presentations BUS6630/BUS6632	

Course/Course Code	Concentration Sequences	Specialization Sequences
Advanced Engineering DTE8491	See Introduction to Engineering DTE8490	
Advanced Fashion Marketing MKT8145/ MKT8146	See Fashion Marketing MKT8140/MKT8141	
Advanced Hotel/Motel Marketing MKT8162/MKT8163	See Hotel/Motel Marketing MKT8160/MKT8161	
Advanced International Marketing MKT8136	See International Marketing MKT8135	
Advanced Manufacturing Systems DTE8427	See Manufacturing Systems DTE8426	
Advanced Marketing MKT8130/MKT8131	See Marketing MKT8120/MKT8121	
Advanced Programming BUS6641	See Programming BUS6640	
Advanced Sports, Entertainment, and Recreation Marketing MKT8177/MKT8178	See Sports, Entertainment, and Recreation Marketing MKT8175/8176	
Advanced Travel and Tourism Marketing MKT8167/MKT8168	See Travel and Tourism Marketing MKT8165/MKT8166	
Advanced Turf Grass Applications ANR8054	See Turf Establishment and Maintenance ANR8051	
Advertising Design TDI8570/8571/8572	All T&I courses available for the 3-year scheduling option are listed as specializations.	Advertising Design I TDI8570 **and** Advertising Design II TDI8571 **and** Advertising Design III TDI8572 **or** ICT TDI8904 if needed for local scheduling option
Agricultural Business Fundamentals ANR8022	Agricultural Mechanics and Basic Plant Science ANR8006 **or** Agricultural Mechanics and Basic Animal Science ANR8008 **and** one of the following: • Agricultural Business Fundamentals ANR8022 • Agricultural Business Operations ANR8024 • Agricultural Business Management ANR8026	Agricultural Mechanics and Basic Plant Science ANR8006 **or** Agricultural Mechanics and Basic Animal Science ANR8008 **and** two of the courses listed for concentration
Agricultural Business Management ANR8026	See Agricultural Business Fundamentals ANR8022	
Agricultural Business Operations ANR8024	See Agricultural Business Fundamentals ANR8022	
Agricultural Education for the Disabled ANR8050 Agricultural Education for the Disadvantaged ANR8053	Further information on these courses can be obtained from the Agricultural Education Program Specialist, Virginia Department of Education.	

Course/Course Code	Concentration Sequences	Specialization Sequences
Agricultural Mechanics and Basic Animal Science ANR8008	Agricultural Mechanics and Basic Animal Science ANR8008 **and one** of the following courses: • Agricultural Production Technology ANR8010 • Agricultural Production Management ANR8012 • Operating the Farm Business ANR8014 • Agricultural Power and Equipment ANR8016 • Agricultural Mechanization Sales and Service ANR8018 • Advanced Agricultural Mechanization ANR8020 • Agricultural Business Fundamentals ANR8022 • Agricultural Business Operations ANR8024 • Agricultural Business Management ANR8026 • Introduction to Natural Resources ANR8040 • Forestry, Wildlife, and Soil Management ANR8042 • Natural Resources Business Management ANR8044 • Equine Management ANR8080 • Small Animal Care I ANR8083 • Small Animal Care II ANR8084	Agricultural Mechanics and Basic Animal Science ANR8008 **and** two or more of the courses listed for concentration
Agricultural Mechanics and Basic Plant Science ANR8006	Agricultural Mechanics and Basic Plant Science ANR8006 **and** one or more of the following courses: • Agricultural Production Technology ANR8010 • Agricultural Production Management ANR8012 • Operating the Farm Business ANR8014 • Agricultural Power and Equipment ANR8016 • Agricultural Mechanization Sales and Service ANR8018 • Advanced Agricultural Mechanization ANR8020 • Agricultural Business Fundamentals ANR8022 • Agricultural Business Operations ANR8024 • Agricultural Business Management ANR8026 • Ecology/Environmental Management ANR8046 • Horticulture Sciences ANR8034 • Floral Design I ANR8055 • Floral Design II ANR8056 • Floriculture ANR8038 • Greenhouse Plant Production and Management ANR8035 • Landscaping ANR8036 • Specialty Horticultural Arts ANR8037 • Introduction to Natural Resources ANR8040 • Forestry, Wildlife, and Soil Management ANR8042 • Natural Resources Business Management ANR8044 • Turf Establishment and Maintenance ANR8051 • Advanced Turf Grass Applications ANR8054	Agricultural Mechanics **and** Basic Plant Science ANR8006 **and** two or more of the courses listed for concentration

Course/Course Code	Concentration Sequences	Specialization Sequences
Agricultural Mechanization Sales and Service ANR8018	See Agricultural Power and Equipment ANR8016	
Agricultural Power and Equipment ANR8016	Agricultural Mechanics and Basic Plant Science ANR006 **or** Agricultural Mechanics and Basic Animal Science ANR8008 **and one** of the following: • Agricultural Power and Equipment ANR8016 • Agricultural Mechanization Sales and Service ANR8018 • Advanced Agricultural Mechanization ANR8020	Agricultural Mechanics and Basic Plant Science ANR8006 **or** Agricultural Mechanics and Basic Animal Science ANR8008 **and** two or more courses listed for concentration Additional choices for specialization: • Technology Foundations DTE8403 • Technology Transfer DTE8405
Agricultural Production Management ANR8012	See Agricultural Production Technology ANR8010	
Agricultural Production Technology ANR8010	Agricultural Mechanics and Basic Animal Science ANR8008 **or** Agricultural Mechanics and Basic Plant Science ANR8006 **and** one of the following: • Agricultural Production Technology ANR8010 • Agricultural Production Management ANR8012 • Operating the Farm Business ANR8014	Agricultural Mechanics and Basic Animal Science ANR8008 **or** Agricultural Mechanics and Basic Plant Science ANR8006 **and** two or more of the courses listed for concentration Additional courses available for specialization: • Equine Management ANR8080 • Small Animal Care I ANR8083 • Horticulture Sciences ANR8034 • Greenhouse Plant Production and Management ANR8035 • Landscaping ANR8036 • Floriculture ANR8038 • Turf Establishment and Maintenace ANR8051 • Advanced Turf Grass Applications ANR8054
Aircraft Pilot Training TDI8731/TDI8732	Aircraft Pilot Training I TDI8731 **and** Aircraft Pilot Training II TDI8732	
Applied Agricultural Concepts ANR8072/ANR8073	Further information on this course can be obtained from the Agricultural Education Program Specialist, Virginia Department of Education.	
Architectural Drawing/Design DTE8437/DTE8492	Technical Drawing/Design DTE8435 **and** Architectural Drawing/Design DTE8437	Technical Drawing/Design DTE8435 **and** Engineering Drawing/Design DTE8436 **and** Architectural Drawing/Design DTE8437
Automotive Body Repair TDI8679/TDI8680/ TDI8681—Noncertified	Further information on these courses can be obtained from the Trade and Industrial Education Program Specialist, Virginia Department of Education.	
Automotive Body Technology TDI8676/TDI8677/TDI8678—Certified	All T&I courses available for the 3-year scheduling option are listed as specializations.	Automotive Body Technology I—Certified TDI8676 **and** Automotive Body Technology II—Certified TDI8677 **and** Automotive Body Technology III—Certified TDI8678 **or** ICT TDI8904 if needed for local scheduling option

Course/Course Code	Concentration Sequences	Specialization Sequences
Automotive Maintenance TDI8709—one-year course	Automotive Maintenance TDI8709 **and** one of the following: • Principles of Technology I DTE9811 • Power and Transportation DTE8445 • Energy and Power DTE8448	Automotive Maintenance TDI8709 **and** Principles of Technology I DTE9811 **or** Power and Transportation DTE8445 **or** Energy and Power DTE8448 **and one** of the following: • Entrepreneurship Education CCN9094 • Industrial Cooperative Training TDI8904
Automotive Service Technology TDI8506/TDI8507/TDI8508—Certified	All T&I courses available for the 3-year scheduling option are listed as specializations.	Automotive Service Technology I—Certified TDI8506 **and** Automotive Service Technology II—Certified TDI8507 **and** Automotive Service Technology III—Certified TDI8508 **or** ICT TDI8904 if needed for local scheduling option
Automotive Servicing TDI8710/TDI8711/ TDI8712—Noncertified	Further information on these courses can be obtained from the Trade and Industrial Education Program Specialist, Virginia Department of Education.	
Aviation Maintenance Technology TDI8728/TDI8729	Aviation Maintenance Technology I TDI8728 **and** Aviation Maintenance Technology II TDI8729	
Basic Automotive Body Repair TDI8675—one-year course	Basic Automotive Body Repair TDI8675 **and** one of the following: • Materials and Processes DTE8433 • Principles of Technology I DTE9811	Basic Automotive Body Repair TDI8675 **and** Materials and Processes DTE8433 **or** Principles of Technology I DTE9811 **and** one of the following: • Entrepreneurship Education CCN9094 • Industrial Cooperative Training TDI8904
Basic Carpentry TDI8600—one-year course	Basic Carpentry TDI8600 **and** one of the following: • Technical Drawing/Design DTE8435 • Construction Technology DTE8431 • Materials and Processes DTE8433	Basic Carpentry TDI8600 **and** Technical Drawing/Design DTE8435 **or** Construction Technology DTE8431 **or** Materials and Processes DTE8433 **and** one of the following: • Entrepreneurship Education CCN9094 • Industrial Cooperative Training TDI8904
Basic Photography TDI8610—one-year course	Basic Photography TDI8610 **and** Communications Systems DTE8415 **or** Graphic Communications Systems DTE8458	Basic Photography TDI8610 **and** Communications Systems DTE8415 **or** Graphic Communications Systems DTE8458 **and** one of the following: • Entrepreneurship Education CCN9094 • Industrial Cooperative Training TDI8904
Basic Small Engine Repair TDI8724—one-year course	Basic Small Engine Repair TDI8724 **and** one of the following: • Agricultural Power and Equipment ANR8016 • Small Engine Repair ANR8082	Basic Small Engine Repair TDI8724 **and** Agricultural Power and Equipment ANR8016 **or** Small Engine Repair ANR8082 **and** one of the following: • Entrepreneurship Education CCN9094 • Industrial Cooperative Training TDI8904
Bioengineering DTE8467	Biotechnology Foundations DTE9820 **and** Bioengineering DTE8467	Biotechnology Foundations DTE9820 **and** Bioengineering DTE8467 and Electronics Systems DTE8416

Course/Course Code	Concentration Sequences	Specialization Sequences
Biological Applications in Agriculture ANR8086	Further information on these courses can be obtained from the Agricultural Education Program Specialist, Virginia Department of Education.	
Biotechnology Applications in Agriculture ANR8087	Biotechnology Foundations DTE9820 **and** Biotechnology Applications in Agriculture ANR8087	Biotechnology Foundations DTE9820 **and** Biotechnology Applications in Agriculture ANR8087 **and** one additional course that addresses plant or animal science
Biotechnology Foundations DTE9820	Biotechnology Foundations DTE9820 **and** one of the following: • Bioengineering DTE8467 • Biomedical Technology HMS8347 • Biotechnology Applications in Agriculture ANR8087	Biotechnology Foundations DTE9820 **and** Bioengineering DTE8467 **and** one of the following: • Biomedical Technology HMS8347 • Biotechnology Applications in Agriculture ANR8087 • Electronics Systems DTE8416
Bricklayer TDI8511—one-year course	Bricklayer TDI8511 **and** one of the following: • Technical Drawing/Design DTE8435 • Materials and Processes DTE8433 • Construction Technology DTE8431	Bricklayer TDI8511 **and** Technical Drawing/Design DTE8435 **or** Materials and Processes DTE8433 **or** Construction Technology DTE8431 **and** one of the following: • Entrepreneurship Education CCN9094 • Industrial Cooperative Training TDI8904
Building Trades TDI8515/TDI8516/TDI8517	All T&I courses available for the 3-year scheduling option are listed as specializations.	Building Trades I TDI8515 **and** Building Trades II TDI8516 **and** Building Trades III TDI8517 **or** ICT TDI8904 if needed for local scheduling option
Business and Information Technology Dual Enrollment BUS6810	Further information on dual enrollment can be obtained from the Business and Information Technology Program Specialist, Virginia Department of Education.	

Course/Course Code	Concentration Sequences	Specialization Sequences
Business Law BUS6131/BUS6132 **Prerequisite:** None	Business Law BUS6131, BUS6132* **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Accounting BUS6320 • Advanced Accounting BUS6321 (requires Accounting prerequisite) • Business Management BUS6135/BUS6136* • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/ BUS6614* • Advanced Computer Information Systems BUS6613/BUS6615* (requires CIS prerequisite) • Desktop/Multimedia Presentations BUS6630/BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/ BUS6633* (requires Desktop/Multimedia Presentations prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Finance BUS6120/BUS6121* • Legal Systems Administration BUS6735/BUS6736* • Notetaking BUS6241, BUS6242* (may complement sequence but must be offered with two or more other courses) • Office Administration BUS6621/BUS6622* • Principles of Business and Marketing BUS6115/ BUS6116* • Word Processing BUS6625/BUS6626* *18-week course*	Business Law BUS6131/BUS6132* **and** a combination of one or more 18-week or 36-week courses listed for concentration, equivalent to a total of three 36-week courses *18-week course*

Course/Course Code	Concentration Sequences	Specialization Sequences
Business Management BUS6135/BUS6136 **Prerequisite:** None	Business Management BUS6135/BUS6136* and a combination of one or more of the following 18-week or 36-week courses, equivalent to a total of two 36-week courses: • Accounting BUS6320 • Advanced Accounting BUS6321 (requires Accounting prerequisite) • Business Law BUS6131, BUS6132* • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612, BUS6614* • Advanced Computer Information Systems BUS6613, BUS6615* (requires CIS prerequisite) • Desktop/Multimedia Presentations BUS6630/BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/ BUS6633* (requires DTMP prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Finance BUS6120, BUS6121* • Notetaking BUS6241, BUS6242* (may complement sequence but must be offered with two or more other courses) • Office Administration BUS6621, BUS6622* • Principles of Business and Marketing BUS6115/ BUS6116* • Word Processing BUS6625/BUS6626* *18-week course* Also see International Baccalaureate Business Management IB6135.	Business Management BUS6135/BUS6136* **and** a combination of one or more 18-week or 36-week courses listed for concentration, equivalent to a total of three 36-week courses *18-week course*
Cabinetmaking TDI8604/TDI8605/TDI8606	All T&I courses available for the 3-year scheduling option are listed as specializations.	Cabinetmaking I TDI8604 **and** Cabinetmaking II TDI8605 **and** Cabinetmaking III TDI8606 **or** ICT TDI8904 if needed for local scheduling option
Career Pathways CCN9070/CCN9071/CCN9072/CCN9073	Further information regarding this career exploration course is available from the Career Connections Service, Virginia Department of Education.	
Carpentry TDI8601/TDI8602/TDI8603	All T&I courses available for the 3-year scheduling option are listed as specializations.	Carpentry I TDI8601 **and** Carpentry II TDI8602 **and** Carpentry III TDI8603 **or** ICT TDI8904 if needed for local scheduling option
Commercial Photography TDI8607/TDI8606/ TDI8609	All T&I courses available for the 3-year scheduling option are listed as specializations.	Commercial Photography I TDI8607 **and** Commercial Photography II TDI8608 **and** Commercial Photography III TDI8609 **or** ICT TDI8904 if needed for local scheduling option

Course/Course Code	Concentration Sequences	Specialization Sequences
Commercial Sewing TDI8524/TDI8525/ TDI8526	All T&I courses available for the 3-year scheduling option are listed as specializations.	Commercial Sewing I 8524 **and** Commercial Sewing II 8525 **and** Commercial Sewing III 8526 **or** ICT TDI8904 if needed for local scheduling option
Communication Systems DTE8415/DTE8418	Communication Systems DTE8415 **and** Graphic Communications Systems DTE8458	Communication Systems DTE8415 **and** Graphic Communications Systems DTE8458 **and** one of the following: • Technology Foundations DTE8403 • Computer Control and Automation DRE8421

Course/Course Code	Concentration Sequences	Specialization Sequences
Computer Applications BUS6611/BUS617 **Prerequisite:** Keyboarding* is recommended. *Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	Computer Applications BUS6611/BUS6617* **and** a combination of one or more of the following 18-week or 36-week courses, equivalent to a total of two 36-week courses: • Accounting BUS6320 • Advanced Accounting BUS 6321 (requires Accounting prerequisite) • Business Law BUS6131/BUS6132* • Business Management BUS6135/BUS6136* • Computer Information Systems (CIS) BUS6612/6614* • Advanced Computer Information Systems BUS6613/BUS6615* (requires CIS prerequisite) • Computer Network Software Operations (CNSO) BUS6650 • Advanced Computer Network Software Operations BUS6651 (requires CNSO prerequisite) • Database Design and Management (DDM) BUS6660 • Advanced Database Design and Management BUS6661 (requires DDM prerequisite) • Desktop/Multimedia Presentations (DTMM)BUS6631/BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/ BUS6633* (requires DTMM prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Finance BUS6120/6121* • Information Technology Fundamentals BUS6670 • International Baccalaureate Information Technology in a Global Society IB6613 • Keyboarding BUS6151* • Keyboarding Applications BUS6152/BUS6153* • Legal Systems Administration BUS6735/BUS6736* • Medical Systems Administration BUS6730/BUS6731* • Office Administration BUS6621/BUS6622* • Office Specialist BUS6740/BUS6741/BUS6742 • Principles of Business and Marketing BUS6115/BUS6116* • Programming BUS6640 • Advanced Programming BUS6641 (requires Programming prerequisite) • Word Processing BUS6625/BUS6626 **18-week course*	Computer Applications BUS6611/*BUS6617 **and** a combination of one or more 18-week or 36-week courses listed for concentration, equivalent to a total of three 36-week courses
Computer Control and Automation DTE8421/DTE8420	Computer Control and Automation DTE8421 **and** one of the following: • Communication Systems DTE8415 • Graphic Communications Systems DTE8458	Computer Control and Automation DTE8421 **and** Communication Systems DTE8415 **and** one of the following: • Graphic Communications Systems DTE8458 • Electronics Systems DTE8416

Course/Course Code	Concentration Sequences	Specialization Sequences
Computer Information Systems BUS6612/BUS6614 **Prerequisite:** Keyboarding* *Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	Computer Information Systems BUS6612/BUS6614* **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses • Advanced Computer Information Systems BUS6613/BUS6615* • Accounting BUS6320 • Advanced Accounting BUS6321 (requires Accounting prerequisite) • Business Law BUS6131/BUS6132* • Business Management BUS6135/BUS6136* • Computer Applications BUS6611/BUS6617* • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651 • Database Design and Management (DDM) BUS6660 • Advanced Database Design and Management BUS6661 (requires DDM prerequisite) • Desktop/Multimedia Presentations (DTMP) BUS6630/BUS6632 • Advanced Desktop/Multimedia Presentations BUS6631/BUS6633* (requires DTMP prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Finance BUS6120/BUS6121* • Information Technology Fundamentals BUS6670 • Keyboarding Applications BUS6152/BUS6153* • Keyboarding BUS6151* • Notetaking BUS6241, BUS6242* (may complement sequence but must be offered with two or more other courses) • Office Administration BUS6621/BUS6622* • Principles of Business and Marketing BUS6115/BUS6116* • Programming BUS6640 • Advanced Programming BUS6641 (requires Programming prerequisite) • Advanced Information Technology Certifications I (AITC) BUS6680 • Advanced Information Technology Certifications II BUS6681 (requires AITC I prerequisite) *18-week course* Also, see International Baccalaureate Information Technology in a Global Society IB6613	Computer Information Systems BUS6612/BUS6614* **and** a combination of one or more 18-week or 36-week courses listed for concentration, equivalent to a total of three 36-week courses *18-week course*

Course/Course Code	Concentration Sequences	Specialization Sequences
Computer Maintenance TDI8621—one-year course	Computer Maintenance TDI8621 **and** one of the following: • Electronics Systems I DTE8416 • Computer Control and Automation DTE8421	Computer Maintenance TDI8621 **and** Electronics Systems I DTE8416 **or** Computer Control and Automation DTE8421 **and** one of the following: • Entrepreneurship Education CCN9094 • Industrial Cooperative Training TDI8904
Computer Network Hardware Operations TDI8542/TDI8543/TDI8544/TDI8545 (18-week courses)	Information Technology Fundamentals BUS6670 may precede Computer Networking Hardware Operations I TDI8542. Computer Networking Hardware Operations I TDI8542 **and** Computer Networking Hardware Operations II TDI8543 **and** Computer Networking Hardware Operations III TDI8544 **and** Computer Networking Hardware Operations IV TDI8545	
Computer Network Software Operations BUS6650 **Prerequisite:** Keyboarding* and Information Technology Fundamentals are recommended. *Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	Computer Network Software Operations BUS6650 and a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Advanced Computer Network Software Operations BUS6651 • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/BUS6614* • Advanced Computer Information Systems BUS6613/BUS6615* (requires CIS prerequisite) • Database Design and Management (DDM) (Oracle) BUS6660 • Advanced Database Design and Management (Oracle) BUS 6661 (requires DDM prerequisite) • Desktop/Multimedia Presentations BUS6630/BUS6632 • Information Technology Fundamentals BUS6670 • Programming BUS6640 • Advanced Programming BUS6641 (requires Programming prerequisite) • Advanced Information Technology Certifications I (AITC) BUS6680 • Advanced Information Technology Certifications II BUS6681 (requires AITC I prerequisite) *18-week course* Also, see International Baccalaureate Information Technology in a Global Society IB6613.	Computer Network Software Operations BUS6650 **and** a combination of one or more 18-week or 36-week courses listed for concentration, equivalent to a total of three 36-week courses

Course/Course Code	Concentration Sequences	Specialization Sequences
Computer Solutions BUS6610/6609	This middle school course is a foundation course. It may be sequenced with many other business courses but does not count toward a concentration sequence.	
Computer Systems Technology TDI8622/TDI8623/TDI8624	All T&I courses available for the 3-year scheduling option are listed as specializations.	Information Technology Fundamentals BUS6670 may precede Computer Systems Technology I TDI8622
		Computer Systems Technology I TDI8622 **and** Computer Systems Technology II TDI8623 **and** Computer Systems Technology III TDI8624 **or** ICT TDI8904 if needed for local scheduling option
Construction Technology DTE8431	Construction Technology DTE8431 **and** one of the following: • Production Systems DTE8447 • Materials and Processes Technology DTE8433 • Manufacturing Systems DTE8425	Construction Technology DTE8431 **and** Materials and Processes Technology DTE8433 and one of the following: • Production Systems DTE8447 • Manufacturing Systems DTE8425
Cosmetology TDI8527/TDI8528/TDI8529	All T&I courses available for the 3-year scheduling option are listed as specializations.	Cosmetology I TDI8527 **and** Cosmetology II TDI8528 **and** Cosmetology III TDI8529 **or** ICT TDI8904 if needed for local scheduling option
Criminal Justice TDI8702/TDI8703/TDI8704	All T&I courses available for the 3-year scheduling option are listed as specializations.	Criminal Justice I TDI8702 **and** Criminal Justice II TDI8703 **and** Criminal Justice III TDI8704 **or** ICT TDI8904 if needed for local scheduling option
Culinary Arts TDI8521/TDI8522/8523	All T&I courses available for the 3-year scheduling option are listed as specializations.	Culinary Arts I TDI8521 **and** Culinary Arts II TDI8522 **and** Culinary Arts III TDI8523 **or** ICT TDI8904 if needed for local scheduling option
Culinary Arts FCS8275/FCS8275	Culinary Arts I FCS8275 **and** a combination of courses equivalent to a total of two 36-week courses: • Culinary Arts II FCS8276 • Introduction to Culinary Arts FCS8250 • Individual Development FCS8209*/FCS8210 • Nutrition and Wellness FCS8228*/FCS8229 • Resource Management FCS8214*/FCS8219 • Work and Family Management FCS8205*FCS8282 • GRADS FCS8213	Culinary Arts I FCS8275 and a combination of courses listed for concentration, equivalent to a total of three 36-week courses
Custodial Services TDI8590/TDI8591/TDI8592	All T&I courses available for the 3-year scheduling option are listed as specializations.	Custodial Services I TDI8590 **and** Custodial Services II TDI8591 **and** Custodial Services III TDI8592 **or** ICT8904 if needed for local scheduling option

Course/Course Code	Concentration Sequences	Specialization Sequences
Database Design and Management (Oracle) BUS6660 **Prerequisite:** Information Technology Fundamentals is recommended.	Database Design and Management (Oracle) BUS6660 **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Advanced Database Design and Management (Oracle) BUS6661 (requires DDM prerequisite) • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/BUS6614* • Advanced Computer Information Systems BUS6613/ BUS6615* (requires CIS prerequisite) • Computer Network Software Operations (CNSO) BUS6650 • Advanced Computer Network Software Operations BUS6651 (requires CNSO prerequisite) • Advanced Information Technology Certifications I (AITC) BUS6680 • Advanced Information Technology Certifications II BUS6681 (requires AITC I prerequisite) • Information Technology Fundamentals BUS6670 • Programming BUS6640 • Advanced Programming BUS6641 (requires Programming prerequisite) *18-week course* Also, see International Baccalaureate Information Technology in a Global Society IB6613	Database Design and Management (DDM) (Oracle) BUS6660 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses
Dental Assistant HMS8328/HMS8329	Dental Assistant I HMS8328 Dental Assistant II HMS8329	

Course/Course Code	Concentration Sequences	Specialization Sequences
Desktop/Multimedia Presentations BUS6630/BUS6632 **Prerequisite:** Keyboarding* *Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	Desktop/Multimedia Presentations BUS6630/BUS6632* and a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Advanced Desktop/Multimedia Presentations BUS6631/BUS6633* • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/ BUS6614* • Advanced Computer Information Systems BUS6613/ BUS6615* (requires CIS prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Information Technology Fundamentals BUS6670 • Keyboarding Applications BUS6152, BUS6153* • Keyboarding BUS6151* • Principles of Business and Marketing BUS6115/ BUS6116* • Programming BUS6640 • Advanced Programming BUS6641 (requires Programming prerequisite) • Advanced Information Technology Certifications I (AITC) BUS6680 • Advanced Information Technology Certifications II BUS6681 (requires AITC I prerequisite) *18-week course Also, see International Baccalaureate Information Technology in a Global Society IB6613	Desktop/Multimedia Presentations BUS6630/BUS6632* **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses *18-week course*
Diesel Equipment Technology TDI8615/TDI8616/TDI8617	All T&I courses available for the 3-year scheduling option are listed as specializations.	Diesel Equipment Technology I TDI8615 **and** Diesel Equipment Technology II TDI8616 **and** Diesel Equipment Technology III TDI8617 **or** ICT TDI8904 if needed for local scheduling option

Course/Course Code	Concentration Sequences	Specialization Sequences
Digital Input Technologies BUS6160/ BUS6161 **Prerequisite:** BUS6160: Keyboarding* is recommended. BUS6161: None * Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	Digital Input Technologies BUS6160*/BUS6161 and a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Accounting BUS6320 • Business Law BUS6131/BUS6132* • Business Management BUS6135/BUS6136* • Computer Applications BUS6611/BUS6617* • Computer Information Systems BUS6612/BUS6614* • Information Technology Fundamentals BUS6670 • Keyboarding** BUS6151* or • Keyboarding Applications** BUS6152/BUS6153* • Legal Systems Administration BUS6735 • Medical Systems Administration • Office Administration BUS6621/BUS6622* • Office Specialist BUS6740/BUS6741/BUS6742 • Principles of Business and Marketing BUS6115/ BUS6116* • Word Processing BUS6625/BUS6626* *18 week course ** Only counted as sequential offering with BUS6160. The 36-week DIT course BUS6161 contains keyboarding.	Digital Input Technologies BUS6160*/BUS6161 and a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses: *18 week course
Drafting TDI8530/TDI8531/TDI8532	All T&I courses available for the 3-year scheduling option are listed as specializations.	Drafting I TDI8530 **and** Drafting II TDI8531 **and** Drafting III TDI8532 or ICT TDI8904 if needed for local scheduling option
Early Childhood Education FCS8285/	Early Childhood Education I FCS8285 **and** a combination of one or more of the following courses equivalent to **a total of** two 36-week courses: • Early Childhood Education II FCS8286 • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209*/FCS8210 • Parenting FCS8231 • Introduction to Early Childhood Education FCS8234 • GRADS FCS8213 (with cooperative education) *18-week course	Early Childhood Education I FCS8285 **and** Early Childhood Education II FCS8286 **and** a combination of courses listed for concentration, equivalent to a total of three 36-week courses
Ecology/Environmental Management ANR8045/ANR8046		Agricultural Mechanics and Basic Plant Science ANR8006 **and** Introduction to Natural Resources ANR8040 **and** Ecology/Environmental Management ANR8045*/ANR8046 *18-week course

Course/Course Code	Concentration Sequences	Specialization Sequences
Education for Employment: Introduction CCN9075/CCN9076/CCN9082/ CCN9083 Level I CCN9077/CCN9078/CCN9084/ CCN9085 Level II CCN9079/CCN9080/CCN9086/ CCN9087 EFE Cooperative Education I CCN9020/ CCN9030 EFE Cooperative Education II CCN9021/ CCN9031	Information about these courses for at-risk learners is available from the Career Connections Service, Virginia Department of Education.	
Electricity and Cabling TDI8533/TDI8534/ TDI8535	All T&I courses available for the 3-year scheduling option are listed as specializations.	Electricity and Cabling I TDI8533 **and** Electricity and Cabling II TDI8534 **and** Electricity and Cabling III TDI8535 **or** ICT TDI8904 if needed for local scheduling option
Electronics Systems I DTE8416/DTE8417 Electronics Systems II DTE8412	Electronics Systems I DTE8416 Electronics Systems II DTE8412	Technology Foundations DTE8413 **or** Technical Drawing/Design DTE8435 **and** Electronics Systems I DTE8416 **and** Electronics Systems II DTE8412 **or** Computer Maintenance TDI8621
	Electronics Systems I DTE8416 **and** one of the following: Computer Maintenance TDI8621 Computer Control and Automation DTE8421	
Electronics Technology TDI8536/TDI8537/ TDI8538	All T&I courses available for the 3-year scheduling option are listed as specializations.	Electronics Technology I TDI8536 **and** Electronics Technology II TDI8537 **and** Electronics Technology III TDI8538 **or** ICT TDI8904 (if needed for local scheduling option)
Emergency Medical Technician-B HMS8333/ HMS8334/HMS8335	Emergency Medical Technician-B I HMS8333* **and** Emergency Medical Technician-B II HMS8334* **and** Emergency Medical Technician-B III HMS8335 *18-week course*	
Energy and Power DTE8448/DTE8495	Power and Transportation DTE8445 **and** Energy and Power DTE8448	Power and Transportation DTE8445 **and** Energy and Power DTE8448 **and** Electronics Systems I DTE8416
	Heavy Duty Equipment Repair TDI8612 **and** one of the following: Power and Transportation DTE8445 Energy and Power DTE8448	
Engineering Drawing/Design DTE8436/ DTE8493	Technical Drawing/Design DTE8435 **and** Engineering Drawing/Design DTE8436	Technical Drawing/Design DTE8435 **and** Engineering Drawing/Design DTE8436 **and** Architectural Drawing/Design DTE8437

Course/Course Code	Concentration Sequences	Specialization Sequences
Equine Management and Production ANR8015/ANR8080	Agricultural Mechanics and Basic Animal Science ANR8008 **and** Equine Management ANR8080 (36 weeks)	Agricultural Mechanics and Basic Animal Science ANR8008 **and** Agricultural Production Technology ANR8010 **and** Equine Management ANR8080 (36 weeks)
Entrepreneurship Education CCN9094	See Exploring Entrepreneurship CCN9093	
Exploring Entrepreneurship CCN9093	Entrepreneurship courses may be included in many specializations to provide opportunities for students to investigate or prepare for business ownership. More information is available from the Career Connections Service, Virginia Department of Education.	Example: See Basic Carpentry
Family and Human Services FCS8264/FCS8265	Family and Human Services I FCS8264 **and** a combination of one or more of the following courses equivalent to a total of two 36-week courses • Family and Human Services II FCS 8265 • Introduction to Family and Human Services FCS8237*/FCS8238 • Family Relations FCS8223 • Parenting FCS8231 • Resource Management FCS8214 • Introduction to Early Childhood Education and Services FCS8233 • Work and Family Management FCS8205 • GRADS 8213 (with cooperative education)	Family and Human Services I FCS8264 **and** Family and Human Services II FCS8265 **and** a combination of courses listed for concentration, equivalent to a total of three 36-week courses Also available for specialization: Any Family and Consumer Sciences sequence combined with Home Health Aide HMS8364
Family Relations FCS8223/FCS8225	Family Relations FCS8223* **or** Family Relations FCS8225 **and** a combination of the following courses equivalent to a total of two 36-week courses: • Individual Development FCS8209*/FCS8210 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/FCS8229 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/FCS8219 • Introduction to Early Childhood Education and Services FCS8233*/FCS8234 • Introduction to Family and Human Services FCS8237*/FCS82378 • Leadership Development CCN9091 • Work and Family Management FCS8205 • GRADS FCS8277*/FCS8278 *18-week course*	Family Relations FCS8223 **or** Family Relations FCS8225 **and** a combination of courses listed for concentration, equivalent to a total of three 36-week courses
Farm Equipment Operator ANR8052	This senior-intensified course stands alone; cooperative education is recommended as part of the course.	

Course/Course Code	Concentration Sequences	Specialization Sequences
Fashion Design FCS8280/FCS8281	Fashion Design I FCS8280 and a combination of the following courses, equivalent to a total of two 36-week courses • Fashion Design II FCS8281 • Introduction to Fashion Design and Marketing Occupations FCS8248 • Individual Development FCS8209*/FCS8210 • Life Planning FCS8226*/FCS8227 • Resource Management FCS8214*/FCS8219 *18-week course	Fashion Design I FCS8280 and Fashion Design II FCS828 and a combination of courses listed for concentration, equivalent to a total of three 36-week courses
Fashion Marketing MKT8140/MKT8141	Fashion Marketing MKT8140/8141 and Advanced Fashion Marketing MKT8145/8146	
	Introduction to Fashion Design and Marketing MKT8148/MKT8149 and Fashion Marketing MKT8140/8141 and Advanced Fashion Marketing MKT8145/8146	
	Make It Your Business MKT8109/MKT8112/MKT8113/MKT8114 and Fashion Marketing MKT8140/8141 and Advanced Fashion Marketing MKT8145/8146	
Finance BUS6120/BUS6121 **Prerequisite:** None	Finance BUS6120, BUS6121* and a combination one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Accounting BUS6320 • Advanced Accounting BUS6321 • Business Law BUS6131, BUS6132* • Business Management BUS6135, BUS6136* • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612, BUS6614* • Advanced Computer Information Systems BUS6613, BUS6615* (requires CIS prerequisite) • Principles of Business and Marketing BUS 6115/6116* *18-week course*	Finance BUS6120, BUS6121* and a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses
Financial Services Marketing MKT8180/MKT8181	Financial Services Marketing MKT8180/8181 and one of the following: • Advanced Marketing MKT8130/MKT8131 • Internet Marketing MKT8125 • Marketing Management MKT8132 • International Marketing MKT8135	
Firefighting TDI8705/TDI8706/TDI8707	All T&I courses available for the 3-year scheduling option are listed as specializations.	Firefighting I TDI8705 and Firefighting II TDI8706 and Firefighting III TDI8707 or ICT TDI8904 if needed for local scheduling option
Floral Design I ANR8055	See Horticulture Sciences ANR8034	

Course/Course Code	Concentration Sequences	Specialization Sequences
Floral Design II ANR8056	See Horticulture Sciences ANR8034	
Floriculture ANR8038	See Horticulture Sciences ANR8034	
Forestry, Wildlife, and Soil Management ANR8042	See Introduction to Natural Resources ANR8040	
Fundamentals of Marketing MKT8110	Fundamentals of Marketing may be in included in addition to any two 36-week course sequences for any of the following: • General Marketing • Executive Marketing • Apparel and Accessories Marketing • Hospitality, Tourism, and Recreation Marketing	
General Mechanics for the Disadvantaged ANR8070	Further information about this course can be obtained from the Agricultural Education Program Specialist, Virginia Department of Education.	
GRADS Family Focus FCS8277/FCS8278 GRADS Work Focus FCS8213	GRADS FCS8277*/FCS8278 **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209*/FCS8210 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/FCS8229 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/FCS8219 *18-week course* GRADS FCS8278 **or** GRADS FCS8213 **and** one of the following 36-week transition focus courses: • Introduction to Culinary Arts FCS8250 • Introduction to Early Childhood Education and Services FCS8234 • Introduction to Family and Human Services FCS8238 • Introduction to Fashion Design Occupations FCS8248 • Introduction to Hospitality, Recreation, and Tourism Occupations FCS8259 • Introduction to Housing, Home Furnishings, and Design Occupations FCS8255 • Work and Family Management FCS8282 GRADS FCS8213 (with cooperative education component) **and** one 36-week work focus course: • Culinary Arts I FCS8275 • Early Childhood Education and Services I FCS8285 • Family and Human Services I FCS8264 • Fashion Design Occupations I FCS8280 • Hospitality Services I FCS8202 • Interior Design Occupations I FCS8295	GRADS FCS8277* **or** GRADS FCS8278 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses GRADS FCS8213 and one of the following sequences: • Culinary Arts I FCS8275 **and** Culinary Arts II FCS8276 • Early Childhood Education and Services I FCS8285 **and** Early Childhood Educaiton and Services II FCS828286 • Family and Human Services I FCS8264 **and** Family and Human Services II FCS8265 • Fashion Design Occupations I FCS8280 **and** Fashion Design Occupations II FCS8281 • Hospitality Services I FCS8202 **and** Hospitality Services II FCS8203 • Interior Design Occupations I FCS8295 and Interior Design Occupations II FCS8296 *18-week course* GRADS FCS8213 **and** any combination of one or more 18- and 36-week courses, equivalent to a total of three 36-week courses

Course/Course Code	Concentration Sequences	Specialization Sequences
Graphic Communication Systems DTE8458	Graphic Communications Systems DTE8458 **and** Communications Systems DTE8415	Graphic Communications Systems DTE8458 **and** Communications Systems DTE8415 **and** one of the following: • Computer Control and Automation DTE8421 • Technology Foundations 8403
Graphic Imaging Technology TDI8660/ TDI8661/TDI8662	All T&I courses available for the 3-year scheduling option are listed as specializations.	Graphic Imaging Technology I TDI8660 **and** Graphic Imaging Technology II TDI8661 **and** Graphic Imaging Technology III TDI8662 or ICT TDI8904 if needed for local scheduling option
Greenhouse Plant Production and Management ANR8035	See Horticulture Sciences ANR8034	
Health Assistant HMS8331/HMS8332	Health Assistant I HMS8331 Health Assistant II HMS8332	
Heating, Ventilation, Air Conditioning, and Refrigeration (HVACR) TDI8503/TDI8504/TDI8505	All T&I courses available for the 3-year scheduling option are listed as specializations.	Heating, Ventilation, Air Conditioning, and Refrigeration (HVACR) I TDI8503 **and** HVACR II TDI8504 **and** HVACR III TDE8505 **or** ICT TDI8904 if needed for local scheduling option
Heavy Duty Equipment Repair TDI8612 (one-year course)	Heavy Duty Equipment Repair TDI8612 **and** one of the following: • Power and Transportation DTE8445 • Energy and Power DTE8448	Heavy Duty Equipment Repair TDI8612 **and** Power and Transportation DTE8445 **or** Energy and Power DTE8448 **and** one of the following: • Entrepreneurship Education CCN9094 • Industrial Cooperative Training TDI8904
Home Health Aide HMS8364	Home Health Aide HMS8364 **and** Family and Human Services I FCS8264	Home Health Aide HMS8364 **and** Introduction to Family and Human Services FCS8237/8238 **and** Family and Human Services I FCS8264 **or** Home Health Aide HMS8364 **and** Family and Human Services I FCS8264 **and** Family and Human Services II FCS8265
Horticulture Sciences ANR8034	Agricultural Mechanics and Basic Plant Science ANR8006 **and** Horticulture Sciences ANR8034 Horticulture Sciences ANR8034 **and** one of the following: • Greenhouse Plant Production and Management ANR8035 • Landscaping ANR8036 • Floriculture ANR8036 • Floral Design I ANR8055 • Specialty Horticulture Arts ANR8037	Agricultural Mechanics and Basic Plant Science ANR8006 **and** Horticulture Sciences ANR8034 **and** two of the following: • Greenhouse Plant Production and Management ANR8035 • Landscaping ANR8036 • Floriculture ANR8036 • Floral Design I ANR8055 • Floral Design II ANR8056 • Specialty Horticulture Arts ANR8037

Course/Course Code	Concentration Sequences	Specialization Sequences
Hospitality Services FCS8202/FCS8203	Hospitality Services I FCS8202 **and** a combination of one or more of the following 18- and 36-week courses, equivalent to a total of two 36-week courses: • Hospitality Services II FCS8203 • Introduction to Hospitality, Tourism, and Recreation Occupations FCS8258*/FCS8259 • Resource Management FCS8219 • GRADS FCS8213	Hospitality Services I FCS8202 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses
Hotel/Motel Marketing MKT8160/MKT8161	Hotel/Motel Marketing MKT8160/MKT8161 **and** one of the following: • Advanced Hotel/Motel Marketing MKT8162/ MKT8163 • Internet Marketing MKT8125	Hotel/Motel Marketing MKT8160/MKT8161 **and** Advanced Hotel/Motel Marketing MKT8162/MKT8163 **and** Internet Marketing MKT8125
Individual Development FCS8209/FCS8210	Individual Development FCS8209*/FCS8210 **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Family Relations FCS8223*/FCS8225 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/FCS8229 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/FCS8219 • Introduction to Consumer Services FCS8235*/FCS8236 • Introduction to Early Childhood Education and Services FCS8233*/FCS8234 • Introduction to Family and Human Services FCS8237*/ FCS8238 • Introduction to Fashion Design and Marketing Occupations FCS8247*/FCS8248 *18-week course	Individual Development FCS8209*/FCS8210 **and** any combination of courses listed for concentration, equivalent to a total of three 36-week courses *18-week course*
Industrial Cooperative Training (ICT) TDI8901/TDI8902/TDI8903	ICT TDI8901 (non coop) **and** ICT TDI8902 (coop)	ICT TDI8901 (non coop) **and** ICT TDI8902 (coop) **and** ICT TCI8903 (coop)
Industrial Cooperative Training (ICT) TDI8904	ICT TDI8904 is a senior-intensified cooperative education course. Further information is available from the Trade and Industrial Education Program Specialist, Virginia Department of Education.	
Industrial Maintenance Technology TDI8575/ TDI8576/TDI8577		Industrial Maintenance Technology I TDI8575 **and** Industrial Maintenance Technology II TDI8576 **and** Industrial Maintenance Technology III TDI8577 **or** ICT TDI8904 if needed for local scheduling option

Course/Course Code	Concentration Sequences	Specialization Sequences
Information Technology Fundamentals BUS6670 **Prerequisite:** Keyboarding* is recommended. * Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	Information Technology Fundamentals BUS6670 and a combination of one or more of the following 18- and 36-week courses, equivalent to a total of two 36-week courses: • Advanced Information Technology Certifications (AITC) I BUS6680 • Advanced Information Technology Certifications II BUS6681 (requires AITC I prerequisite) • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/ BUS6614* • Advanced Computer Information Systems BUS6613/BUS6615* (requires CIS prerequisite) • Computer Network Hardware Operations TDI8542/ TDI8543/TDI8544/TDI8545 • Computer Network Software Operations (CSNO) BUS6650 • Advanced Computer Network Software Operations BUS6651 (requires CSNO prerequisite) • Computer Systems Technology TDI8622/TDI8623/ TDI8624 • Database Design and Management (Oracle) (DDM) BUS6660 • Advanced Database Design and Management BUS6661 (requires DDM prerequisite) • Desktop /Multimedia Presentations (DTMP) BUS6630/ BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/ BUS6633* (requires DTMP prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Programming BUS6640 • Advanced Programming BUS6641 *18-week course*	Information Technology Fundamentals BUS6670 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses
Interior Design FCS8295/FCS8296	Interior Design I FCS8295 **and** a combination of one or more of the following 18- and 36-week courses, equivalent to a total of two 36-week courses: • Interior Design II FCS8296 • Introduction to Housing, Home Furnishings, and Design Occupations FCS8255 • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209*/FCS8210 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/FCS8229 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/FCS8219 • GRADS FCS8213 *18-week course*	Interior Design I FCS8295 **and** Interior Design II FCS8296 **and** a combination of courses listed for concentration, equivalent to a total of three 36-week courses

Course/Course Code	Concentration Sequences	Specialization Sequences
International Baccalaureate Business Management IB6135	See sequences associated with Business Management BUS6135	
International Baccalaureate Information Technology in a Global Society IB6613	See sequences associated with the following: • Computer Application BUS6611/BUS6617 • Computer Information Systems BUS6612/BUS6614 • Computer Network Software Operations BUS6650 • Database Design and Management (Oracle) BUS6660 • Desktop/Multimedia Presentations BUS6630/BUS6632 • Programming BUS6640	
International Marketing MKT8135	International Marketing MKT8135 **and** one of the following: • Advanced International Marketing MKT8136 • Internet Marketing MKT8125	
Internet Marketing MKT8125	Internet Marketing MKT8125 **and** Advanced Marketing MKT8130/8131	Internet Marketing MKT8125 **and** Advanced Marketing MKT8130/8131 **and** Marketing Management MKT8132
Introduction to Culinary Arts FCS8249/ FCS8250 (This is a transition focus course. It must be combined with family focus or work focus courses to make an approved concentration sequence)	Introduction to Culinary Arts FCS8249*/FCS8250 **and** a combination of one or more of the following 18-week and 36-week courses equivalent to a total of two 36-week courses: • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209*/FCS8210 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/FCS8229 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/FCS8219 • Culinary Arts I FCS8275 • Culinary Arts II FCS8276 * *18-week course*	Introduction to Culinary Arts FCS8249*/FCS8250 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses
Introduction to Early Childhood Education FCS8233/FCS8234 (This is a transition focus course. It must be combined with family focus or work focus courses to make an approved concentration sequence)	Introduction to Early Childhood Education and Services FCS8233*/FCS8234 **and** a combination of one or more of the following 18-week and 36-week courses equivalent at least to two 36-week courses: • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209*/FCS8210 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/FCS8229 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/FCS8219 • Early Childhood Education and Services I FCS8285 • Early Childhood Education and Services I IFCS8286 * *18-week course*	Introduction to Early Childhood Education and Services FCS8233*/FCS8234 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses
Introduction to Engineering DTE8490	Introduction to Engineering DTE8490 **and** Advanced Engineering DTE8491	Introduction to Engineering DTE8490 **and** Advanced Engineering DTE8491 **and** Technical Drawing/Design DTE8435

Course/Course Code	Concentration Sequences	Specialization Sequences
Introduction to Family and Human Services FCS8237/FCS8238 (This is a transition focus course. It must be combined with family focus or work focus courses to make an approved concentration sequence)	Introduction to Family and Human Services FCS8237*/ FCS8238 **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209*/FCS8210 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/ FCS8229 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/ FCS8219 • Family and Human Services I FCS8264 • Family and Human Services II FCS8265 *18-week course*	Introduction to Family and Human Services FCS8237*/FCS8238 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses
Introduction to Fashion Design and Marketing FCS8247/ FCS8248 (This is a transition focus course. It must be combined with family focus or work focus courses to make an approved concentration sequence)	Introduction to Fashion Design and Marketing FCS8247*/FCS8248 **and** a combination of one or more of the following 18-week and 36-week courses equivalent to a total of two 36-week courses: • Individual Development FCS8209*/FCS8210 • Life Planning FCS8226*/FCS8227 • Resource Management FCS8214*/FCS8219 • Fashion Design I FCS8280 • Fashion Design II FCS8281 *18-week course*	Introduction to Fashion Design and Marketing FCS8247*/ FCS8248 **and** a combination of one or more of the following 18-week and 36-week courses equivalent to a total of three 36-week courses
Introduction to Fashion Design and Marketing MKT8149	Introduction to Fashion Design and Marketing MKT8149 **and** Fashion Marketing MKT8140/MKT8141 **and** Advanced Fashion Marketing MKT8145/MKT8146	
Introduction to Health and Medical Sciences HMS8302	Introduction to Health and Medical Sciences HMS8302 is recommended as the first course for the following occupational offerings: • Practical Nursing I HMS8357* and Practical Nursing II HMS8358* • Nursing Assistant I HMS8360 • Medical Terminology HMS8383 *18-week course*	

Course/Course Code	Concentration Sequences	Specialization Sequences
Introduction to Hospitality, Tourism, and Recreation FCS8258/FCS8259 (This is a transition-focus course. It must be combined with family focus or work focus courses to make an approved concentration sequence)	Introduction to Hospitality, Tourism, and Recreation Occupations FCS8258/FCS8259 **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209*/FCS8210 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/FCS8229 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/FCS8219 • Hospitality Services I FCS8202 • Hospitality Services II FCS8203 *18-week course*	Introduction to Hospitality, Tourism, and Recreation Occupations FCS8258*/FCS8259 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses *18-week course*
Introduction to Housing, Home Furnishings, and Design FCS8254/ FCS8255 (This is a transition-focus course. It must be combined with family focus or work focus courses to make an approved concentration sequence)	Introduction to Housing, Home Furnishings, and Interior Design Occupations FCS8254*/FCS8255 **and** a combination of one or more of the following 18-week and 36-week courses equivalent to a total of two 36-week courses: • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209*/FCS8210 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/FCS8229 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/FCS8219 • Interior Design I FCS8295 • Interior Design II FCS8296 *18-week course*	Introduction to Housing, Home Furnishings, and Interior Design Occupations FCS8254*/FCS8255 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses *18-week course*
Introduction to Leadership CCN9091	Leadership courses may be included in many concentrations and specializations to help students prepare for and practice family, career, and community leadership roles. More information is available from the Career Connections Service, Virginia Department of Education.	
Introduction to Marketing MKT8111	Introduction to Marketing may be in included in addition to any two 36-week course sequences for any of the following: • General Marketing • Executive Marketing • Apparel and Accessories Marketing • Hospitality, Tourism, and Recreation Marketing • Financial Services Marketing	
Introduction to Natural Resources ANR8040	Agricultural Mechanics and Basic Animal Science ANR8008 **or** Agricultural Mechanics and Basic Plant Science ANR8006 **and** Introduction to Natural Resources ANR8040	Agricultural Mechanics and Basic Animal Science ANR8008 **or** Agricultural Mechanics and Basic Plant Science ANR8006 **and** Introduction to Natural Resources ANR8040 **or** one of the following: • Forestry, Wildlife, and Soil Management ANR8042 • Natural Resources Business Management ANR8044

Course/Course Code	Concentration Sequences	Specialization Sequences
Keyboarding BUS6150 (middle school)	Keyboarding BUS6150 is a foundation course. It may be sequenced with or be a prerequisite for many other business courses but does not count toward a concentration or specialization.	
Keyboarding BUS6151 Keyboarding Applications BUS6152/ BUS6153 **Prerequisite:** None	Keyboarding BUS6151* or Keyboarding Applications BUS6152/BUS6153* and a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Accounting BUS6320 • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/BUS6614* • Advanced Computer Information Systems BUS6613/ BUS6615* (requires CIS prerequisite) • Desktop Multimedia Presentations (DTMP) BUS6630/ BUS6632* • Advanced Desktop Multimedia Presentations BUS6631/ BUS6633* • Digital Input Technologies BUS6160*/BUS6161 • Legal Systems Administration BUS6735/6736* • Medical Systems Administration BUS6730/6731* • Notetaking BUS6241/6242* (may complement the sequence but must be offered with two or more other courses) • Office Administration BUS6621/BUS6622* • Principles of Business and Marketing BUS6115/ BUS6116* • Word Processing BUS6625/BUS6626* *18-week course* *Note:* When students take a keyboarding course as a prerequisite, they may test out through documented proficiency in the course competencies. However, the test-out option does not count toward a concentration or specialization sequence.	Keyboarding BUS6151* or Keyboarding Applications BUS6152/BUS6153* and a combination of 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses:
Landscaping ANR8036	See Horticulture Sciences ANR8034	
Leadership Development CCN9092	See Introduction to Leadership CCN9091	

Course/Course Code	Concentration Sequences	Specialization Sequences
Legal Systems Administration BUS6735/ BUS6736 **Prerequisite:** Keyboarding Applications* * Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	**Option 1** Legal Systems Administration BUS6735 (daily 2-period block) **Option 2** Legal Systems Administration BUS6735/BUS6736* (single or double period) **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Accounting BUS6320 • Advanced Accounting BUS632 (requires Accounting prerequisite) • Business Law BUS6131/BUS6132* • Business Management BUS6135/BUS6136* • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/ BUS6614* • Advanced Computer Information Systems BUS6613/ BUS6615* (requires CIS prerequisite) • Desktop/Multimedia Presentations BUS6630/ BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/ BUS6633* (requires DTMP prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Finance BUS612/BUS6121* • Information Technology Fundamentals BUS6670 • Keyboarding Applications BUS6152/BUS6153* • Keyboarding BUS6151* • Notetaking BUS6241/BUS6242* (may complement the sequence but must be offered with two or more other courses) • Office Administration BUS6621/BUS6622* • Principles of Business and Marketing BUS6115/ BUS6116* • Word Processing BUS6625/BUS6626* *18-week course*	Legal Systems Administration BUS6735 (single or double period) **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses

Course/Course Code	Concentration Sequences	Specialization Sequences
Life Planning FCS8226/FCS8227	Life Planning FCS8226*/FCS8227 **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209/FCS8210 • Nutrition and Wellness FCS8228*/FCS8229 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/FCS8219 • Introduction to Culinary Arts FCS8249*/FCS8250 • Introduction to Early Childhood Education and Services FCS8233*/FCS8234 • Introduction to Family and Human Services FCS8237*/ FCS8238 • Introduction to Fashion Design and Marketing Occupations FCS8247*/FCS8248 • Introduction to Hospitality, Tourism, and Recreation Occupations FCS8258*/FCS8259 • Introduction to Housing, Home Furnishings, and Interior Design Occupations FCS8254*FCS8255 • Introduction to Leadership CCN9091 • Leadership Development CCN9092 (requires Introduction to Leadership prerequisite) • Work and Family Management FCS8205*/FCS8282 • GRADS FCS8278 *18-week course*	Life Planning FCS8226*/FCS8227 **and** any combination of the 18- and 36-week courses listed for concentration, equivalent to a total of three 36-week courses *18-week course*
Make It Your Business BUS6110/BUS6111	Make It Your Business BUS6110 (36 weeks) and BUS6111 (18 weeks) are foundation courses. They may be sequenced with many other business courses but do not count toward a concentration sequence.	
Make It Your Business MKT8114	Make It Your Business MKT8114 (18 weeks) may be included in addition to any two 36-week course sequences for any of the following: • General Marketing • Executive Marketing • Apparel and Accessories Marketing • Hospitality, Tourism, and Recreation Marketing • Financial Services Marketing	
Manufacturing Systems DTE8426	Manufacturing Systems DTE8425 **and** Advanced Manufacturing Systems DTE8427	Manufacturing Systems DTE8425 **and** Advanced Manufacturing Systems DTE8427 **and** one of the following: • Technology Foundations DTE8402 • Production Systems DTE8447

Course/Course Code	Concentration Sequences	Specialization Sequences
Marketing MKT8120/MKT8121	Marketing MKT8120/MKT8121 **and** Advanced Marketing MKT8130/MKT8131 Marketing MKT8120/8121 **and** one of the following: • Internet Marketing MKT8125 • Marketing Management MKT8132	Marketing MKT8120/8121 **and** Advanced Marketing MKT8130/MKET8131 **and** one of the following: Internet Marketing MKT8125 Marketing Management MKT8132
Marketing Management MKT8132	Marketing Management MKT8132 **and** Internet Marketing MKT8125 **or** Marketing MKT8120/MKT8121	
Masonry TDI8512/TDI8513/TDI8514	All T&I courses available for the 3-year scheduling option are listed as specializations.	Masonry I TDI8512 **and** Masonry II TDI8513 **and** Masonry III TDI8514 **or** ICT TDI8904 if needed for local scheduling option
Materials and Processes Technology DTE8433/DTE8434	Production Systems DTE8447 **and** Materials and Processes Technology DTE8433	Production Systems DTE8447 **and** Materials and Processes Technology DTE8433 **and** one of the following: • Construction Technology DTE8431 • Manufacturing Systems DTE8425
Medical Assistant HMS8345/HMS8346	Medical Assistant I HMS8345 **and** Medical Assistant II HMS83	

Course/Course Code	Concentration Sequences	Specialization Sequences
Medical Systems Administration BUS6730/BUS6731 **Prerequisite:** Keyboarding Applications* * Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	**Option 1** Medical Systems Administration BUS6730 (daily 2-hour block) **Option 2** Medical Systems Administration BUS6730/BUS6731* (single or double period) **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Accounting BUS6320 • Advanced Accounting BUS632 (requires Accounting prerequisite) • Business Law BUS6131/BUS6132* • Business Management BUS6135/BUS6136* • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/ BUS6614* • Advanced Computer Information Systems BUS6613/ BUS6615* (requires CIS prerequisite) • Desktop/Multimedia Presentations BUS6630/ BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/ BUS6633* (requires DTMP prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Finance BUS612/BUS6121* • Information Technology Fundamentals BUS6670 • Keyboarding Applications BUS6152/BUS6153* • Keyboarding BUS6151* • Notetaking BUS6241/BUS6242* (may complement the sequence but must be offered with two or more other courses) • Office Administration BUS6621/BUS6622* • Principles of Business and Marketing BUS6115/ BUS6116* • Word Processing BUS6625/BUS6626* *18-week course*	Medical Systems Administration BUS6730/BUS6731* (single or double period) **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses *18-week course* **or** Medical Assistant I HMS8345 **and** Medical Assistant II HMS8346 **and** Medical Systems Administration BUS6730/BUS6731* *18-week course*
Medical Terminology HMS8383	See Introduction to Health and Medical Sciences HMS8302	
Nail Technician TDI8692/TDI8693	Nail Technician I TDI8692 **and** Nail Technician II TDI8693	
Natural Resources Business Management ANR8044	See Introduction to Natural Resources ANR8040	
Notetaking BUS6241/BUS6242	Notetaking may complement a Business/IT concentration sequence but must be offered with two or more other courses.	Notetaking may complement a Business/IT specialization sequence but must be offered with two or more other courses.
Nursing Assistant HMS8360/HMS8362	Nursing Assistant I HMS8360 **and** Nursing Assistant II HMS8362	

Course/Course Code	Concentration Sequences	Specialization Sequences
Nutrition and Wellness FCS8228/FCS8229	Nutrition and Wellness FCS8228*/FCS8229 **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209/FCS8210 • Life Planning FCS8226*/FCS8227 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/FCS8219 • Introduction to Culinary Arts FCS8249*/FCS8250 • Introduction to Early Childhood Education and Services FCS8233*/FCS8234 • Introduction to Family and Human Services FCS8237*/FCS8238 • Introduction to Fashion Design and Marketing Occupations FCS8247*/FCS8248 • Introduction to Hospitality, Tourism, and Recreation Occupations FCS8258*/FCS8259 • Introduction to Housing, Home Furnishings, and Interior Design Occupations FCS8254*FCS8255 • Introduction to Leadership CCN9091 • Leadership Development CCN9092 (requires Introduction to Leadership prerequisite) • Work and Family Management FCS8205*/FCS8282 • GRADS FCS8278 *18-week course*	Nutrition and Wellness FCS8228/FCS8229 **and** a combination of 18- and 36-week courses listed for concentration, equivalent to a total of three 36-week courses

Course/Course Code	Concentration Sequences	Specialization Sequences
Office Administration BUS6621/6622 **Prerequisite:** Keyboarding* * Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	Office Administration BUS6621/BUS6622* **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Accounting BUS6320 • Advanced Accounting BUS632 (requires Accounting prerequisite) • Business Law BUS6131/BUS6132* • Business Management BUS6135/BUS6136* • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/ BUS6614* • Advanced Computer Information Systems BUS6613/ BUS6615* (requires CIS prerequisite) • Desktop/Multimedia Presentations BUS6630/ BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/ BUS6633* (requires DTMP prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Finance BUS6120/BUS6121* • Information Technology Fundamentals BUS6670 • Keyboarding Applications BUS6152/BUS6153* • Keyboarding BUS6151* • Legal Systems Administration BUS6735 • Medical Systems Administration BUS6730/BUS6731* • Notetaking BUS6241/BUS6242* (may complement the sequence but must be offered with two or more other courses) • Principles of Business and Marketing BUS6115/ BUS6116* • Word Processing BUS6625/BUS6626* *18-week course	Office Administration BUS6621*/6622 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses: *18-week course

Course/Course Code	Concentration Sequences	Specialization Sequences
Office Specialist BUS6740/ BUS6741/BUS6742 **Prerequisite:** Keyboarding* * Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	**Option 1** Office Specialist I BUS6740 (daily 2-period block) **Option 2** Office Specialist I BUS6740 (single or double period) **and** a combination of one or more of the following 18-week or 36-week courses, equivalent to a total of two 36-week courses: • Office Specialist II BUS6741 • Office Specialist III BUS6742 • Accounting BUS6320 • Advanced Accounting BUS632 (requires Accounting prerequisite) • Business Law BUS6131/BUS6132* • Business Management BUS6135, BUS6136* • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/ BUS6614* • Advanced Computer Information Systems BUS6613/ BUS6615* (requires CIS prerequisite) • Desktop/Multimedia Presentations BUS6630/ BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/ BUS6633* (requires DTMP prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Finance BUS6120/BUS6121* • Information Technology Fundamentals BUS6670 • Keyboarding Applications BUS6152/BUS6153* • Keyboarding BUS6151* • Legal Systems Administration BUS6735 • Medical Systems Administration BUS6730/BUS6731* • Notetaking BUS6241, BUS6242* (may complement the sequence but must be offered with two or more other courses) • Principles of Business and Marketing BUS6115/ BUS6116* • Word Processing BUS6625/BUS6626* *18-week course*	Office Specialist I BUS6740 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses:
Operating the Farm Business ANR8014	See Agricultural Production Technology ANR8010.	

Course/Course Code	Concentration Sequences	Specialization Sequences
Parenting FCS8231/FCS8232	Parenting FCS8231*/FCS8232 **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209/FCS8210 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/FCS8229 • Resource Management FCS8214*/FCS8219 • Introduction to Culinary Arts FCS8249*/FCS8250 • Introduction to Early Childhood Education and Services FCS8233*/FCS8234 • Introduction to Family and Human Services FCS8237*/FCS8238 • Introduction to Fashion Design and Marketing Occupations FCS8247*/FCS8248 • Introduction to Hospitality, Tourism, and Recreation Occupations FCS8258*/FCS8259 • Introduction to Housing, Home Furnishings, and Interior Design Occupations FCS8254*/FCS8255 • Introduction to Leadership CCN9091 • Leadership Development CCN9092 (requires Introduction to Leadership prerequisite) • Work and Family Management FCS8205*/FCS8282 • GRADS FCS8278 *18-week course*	Parenting FCS8231*/FCS8232 **and** any combination of one or more 18- and 36-week courses listed for concentration, equivalent to a total of three 36-week courses *18-week course*
Pharmacy Technician HMS8305	Pharmacy Technician HMS8305 is a triple-period course that stands alone.	
Physical/Occupational Therapy HMS8365	Physical/ Occupational Therapy HMS8365 (double-period class)	
Plumbing TDI8551/TDI8552/TDI8553	All T&I courses available for the 3-year scheduling option are listed as specializations.	Plumbing I TDI8551 **and** Plumbing II TDI8552 **and** Plumbing III TDI8552 **or** ICT TDI8904 if needed for local scheduling option
Power and Transportation DTE8444/ DTE8445	Power and Transportation DTE8445 **and** Energy and Power DTE8448 Power and Transportation DTE8445 **and** Heavy Duty Equipment Repair TDI8612	Power and Transportation DTE8445 **and** Energy and Power DTE8448 **and** Electronics Systems I DTE8416
Practical Nursing HMS8357/HMS8358/HMS8359	Practical Nursing I HMS8357* **and** Practical Nursing II HMS8358* **and** Practical Nursing III HMS8359 *18-week course*	
Precision Machining Technology TDI8539/ TDI8540/TDI8541	All T&I courses available for the 3-year scheduling option are listed as specializations.	Precision Machining Technology I TDI8539 **and** Precision Machining Technology II TDI8540 **and** Precision Machining Technology III TDI8541 **or** ICT TDI8904 if needed for local scheduling option

Course/Course Code	Concentration Sequences	Specialization Sequences
Principles of Business and Marketing BUS6115/BUS6116 **Prereqisite:** None	Principles of Business and Marketing BUS6115/BUS6116* and a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Accounting BUS6320 • Advanced Accounting BUS6321 (requires Accounting prerequisite) • Business Law BUS6131/BUS6132* • Business Management BUS6135/BUS6136* • Computer Applications BUS6611/BUS6617* • Computer Information Systems BUS6612/BUS6614* • Advanced Computer Information Systems BUS6613/BUS6615* (requires CIS prerequisite) • Desktop/Multimedia Presentations BUS6630/BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/BUS6633* (requires Desktop Multimedia prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Finance BUS6120/BUS6121* • Keyboarding BUS6151 • Keyboarding Applications BUS6152/BUS6153* • Legal Systems Administration BUS6735/6736* • Medical Systems Administration BUS6730/BUS6731* • Office Administration BUS6621/BUS6622* • Office Specialization BUS6740/BUS6741/BUS6742 • Word Processing BUS6625/BUS6626* *18-week course*	Principles of Business and Marketing BUS6115/BUS6116* and a combination of one or more of the 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses
Principles of Business and Marketing MKT8115/MKT8116	Principles of Business and Marketing MKT8115/MKT8116 is a part of the General Marketing sequence and may be sequenced with other marketing courses but does not count toward a concentration sequence.	
Principles of Technology DTE9811/DTE9812	Principles of Technology I DTE9811 **and** Principles of Technology II DTE9812	
Production Systems DTE8446/DTE8447	Production Systems DTE8447 **and** one of the following: • Materials and Processes Technology DTE8433 • Construction Technology DTE8431 • Manufacturing Systems DTE8425	Production Systems DTE8447 **and** Materials and Processes Technology DTE8433 **and** one of the following: • Construction Technology DTE8431 • Manufacturing Systems DTE8425

Course/Course Code	Concentration Sequences	Specialization Sequences
Programming BUS6640 **Prerequisite:** Keyboarding* and Information Technology Fundamentals are recommended. * Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	Programming BUS6640 and a combination of one or more of the following 18-week or 36-week courses, equivalent to a total of two 36-week courses: • Advanced Programming BUS6641 • Advanced Information Technology Certifications (AITC) I BUS6680 • Advanced Information Technology Certifications (AITC) II BUS6681 (requires AITC I prerequisite) • Computer Applications BUS6611/BUS6617* • Computer Information Systems (CIS) BUS6612/BUS6614* • Advanced Computer Information Systems BUS6613/BUS6615* (requires CIS prerequisite) • Computer Network Software Administration (CNSA) BUS6650 • Advanced Computer Network Software Administration BUS6651 (requires CNSA prerequisite) • Database Design and Management (DDM) BUS6660 • Advanced Database Design and Management BUS6661 (requires DDM prerequisite) • Desktop/Multimedia Presentations (DTMP) BUS6630/BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/BUS6633* (requires DTMP prerequisite) • Information Technology Fundamentals BUS6670 *18-week course Also, see International Baccalaureate Information Technology in a Global Society IB6613.	Programming BUS6640 and a combination of 18-week or 36-week courses, equivalent to a total of three 36-week courses
Public Safety TDI8700/TDI8701	Public Safety I TDI8700 **and** Public Safety II TDI8701	
Radio Communications TDI8640/TDI8641/TDI8642	All T&I courses available for the 3-year scheduling option are listed as specializations.	Radio Communications I TDI8640 **and** Radio Communications II TDI8641 **and** Radio Communications III TDI8642 **or** ICT TDI8904 if needed for local scheduling option
Real Estate Marketing MKT8191	Real Estate Marketing MKT8191 and one of the following: • Marketing 8120/8121 • Internet Marketing 8125 • International Marketing 8135 • Marketing Management 8132 • One of the Hospitality, Tourism, and Recreation Marketing courses	

Course/Course Code	Concentration Sequences	Specialization Sequences
Resource Management FCS8214/FCS8219	Resource Management FCS8214*/FCS8219 **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209/FCS8210 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/FCS8229 • Parenting FCS8231*/FCS8232 • Introduction to Culinary Arts FCS8249*/FCS8250 • Introduction to Early Childhood Education and Services FCS8233*/FCS8234 • Introduction to Family and Human Services FCS8237*/FCS8238 • Introduction to Fashion Design and Marketing Occupations FCS8247*/FCS8248 • Introduction to Hospitality, Tourism, and Recreation Occupations FCS8258*/FCS8259 • Introduction to Housing, Home Furnishings, and Interior Design Occupations FCS8254*FCS8255 • Introduction to Leadership CCN9091 • Leadership Development CCN9092 (requires Introduction to Leadership prerequisite) • Work and Family Management FCS8205*/FCS8282 • GRADS FCS8278 *18-week course*	Resource Management FCS8214*/FCS8219 **and** any combination of 18- and 36-week courses, equivalent to a total of three 36-week courses *18-week course*
Restaurant Marketing MKT8170	Restaurant Marketing MKT8170 **and** one of the following: • Advanced Marketing MKT8130/MKT8131 • Internet Marketing MKT8125 • Marketing Management MKT8132 • International Marketing MKT8135	
Robotic Workcell Technology TDI8557/ TDI8558/TDI8559	All T&I courses available for the 3-year scheduling option are listed as specializations.	Robotic Workcell Technology I TDI8557 **and** Robotic Workcell Technology II TDI8558 **and** Robotic Workcell Technology III TDI8559 **or** ICT TDI8904 if needed for local scheduling option
Sheet Metal TDI8663/TDI8664/TDI8665	All T&I courses available for the 3-year scheduling option are listed as specializations.	Sheet Metal I TDI8663 **and** Sheet Metal II TDI8664 **and** Sheet Metal III TDI8665 **or** ICT TDI8904 if needed for local scheduling option
Small Animal Care I ANR8083	Agricultural Mechanics and Basic Animal Science ANR8008 **and** Small Animal Care I ANR8083	Agricultural Mechanics and Basic Animal Science ANR8008 **and** Small Animal Care I ANR8083 **and** Small Animal Care II ANR8084
Small Animal Care II ANR8084	See Small Animal Care I ANR8083	

Course/Course Code	Concentration Sequences	Specialization Sequences
Small Engine Repair ANR8021/ANR8082	Agricultural Mechanics and Basic Plant Science ANR8006 **or** Agricultural Mechanics and Basic Animal Science ANR8008 **and** Small Engine Repair ANR8082 **or** Basic Small Engine Repair TDI8724 **and** Small Engine Repair ANR8082	Basic Small Engine Repair TDI8724 **and** Small Engine Repair ANR8082 **and one** of the following: • Entrepreneurship Education CCN9094 • Industrial Cooperative Training TDI8904
Small Engine Repair TDI8725/TDI8726/ TDI8727	All T&I courses available for the 3-year scheduling option are listed as specializations.	Small Engine Repair I TDI8725 **and** Small Engine Repair II TDI8726 **and** Small Engine Repair III TDI8727 **or** ICT TDI8904 if needed for local scheduling option
Specialty Horticulture Arts ANR8037	See Horticulture Sciences ANR8034	
Sports, Entertainment, and Recreation Marketing MKT8175/MKT8176	Sports, Entertainment, and Recreation MKT8175/MKT8176 **and** one of the following: • Advanced Sports, Entertainment, and Recreation MKT8177/8178 • Advanced Marketing MKT8130/MKT8131 • Internet Marketing MKT8125 • Marketing Management MKT8132	
Surgical Technologist HMS8351/HMS8352	Surgical Technologist I HMS8351 **and** Surgical Technologist II (Adult) HMS835	
Teacher Cadet CCN9062	Teacher Cadet (CCN9062) (36 weeks) **and** two of the following 18-week courses: • Individual Development FCS8209 • Introduction to Early Childhood Education FCS8233 • Introduction to Leadership CCN9091 • Leadership Development CCN9092 • Life Planning FCS8226 • Parenting FCS8231 Teacher Cadet (CCN9062) (36 weeks) and one of the following 36-week courses: • Early Childhood Cooperative Education I FCS8293 • Early Childhood Cooperative Education II FCS8294 • Early Childhood Education I FCS8285 • Early Childhood Education II FCS8286 • Individual Development FCS8210 • Introduction to Early Childhood Education FCS8234 • Introduction to Leadership CCN9091 • Leadership Development CCN9092 • Life Planning FCS8227 • Parenting FCS8232 • Psychology I 2900 • Psychology II 2901 • Sociology 2500	

Course/Course Code	Concentration Sequences	Specialization Sequences
Technical Drawing/Design DTE8434/DTE8435	Technical Drawing/Design DTE8435 **and** one of the following: • Engineering Drawing/Design DTE8436 • Architectural Drawing/Design DTE8437	Technical Drawing/Design DTE8435 **and** Engineering Drawing/Design DTE8436 **and** Architectural Drawing/Design DTE8437
Technology Assessment DTE8406/DTE8407	See Technology Foundations DTE8403	
Technology Foundations DTE8402/DTE8403	Technology Foundations DTE8403 **and** one of the following: • Technology Transfer DTE8405 • Technology Assessment DTE8407	Technology Foundations DTE8403 **and** Technology Transfer DTE8405 **and** Technology Assessment DTE8407
		Technology Foundations DTE8403 **and one** of the following: Technology Transfer DTE8405 **and one** additional 36-week **or two** additional 18-week Technology Education courses
Technology Transfer DTE8404/DTE8405	See Technology Foundations DTE8403	
Telecommunications TDI8650/TDI8651	Telecommunications I TDI8650 **and** Telecommunications II TDI8651	
Television Production TDI8688/TDI8689/ TDI8690	All T&I courses available for the 3-year scheduling option are listed as specializations.	Television Production I TDI8688 **and** Television Production II TDI8689 **and** Television Production III TDI8690 **or** ICT TDI8904 if needed for local scheduling option
Travel and Tourism Marketing MKT8165/ MKT8166	Travel/Tourism MKT8165/MKT8166 **and** Advanced Travel/Tourism MKT8167/MKT8168 **or** Internet Marketing MKT8125	
Turf Establishment and Maintenance ANR8051	Agricultural Mechanics and Basic Plant Science ANR8006 **and** Turf Establishment and Maintenance ANR8051	Agricultural Mechanics and Basic Plant Science ANR8006 **and** Turf Establishment and Maintenance ANR8051 **and** Advanced Turf Grass Applications ANR805
Utility/Heavy Construction Technology TDI8616/TDI8617/TDI8618	All T&I courses available for the 3-year scheduling option are listed as specializations.	Utility/Heavy Construction Technology I TDI8616 **and** Utility/Heavy Construction Technology II TDI8617 **and** Utility/Heavy Construction Technology III TDI8618 or ICT TDI8904 if needed for local scheduling option
Veterinary Assistant Level I HMS8310 Veterinary Assistant Level II HMS8311 Veterinary Assistant Level III HMS8312	Veterinary Assistant Level I HMS8310 **and** Veterinary Assistant Level II HMS8311	Veterinary Assistant Level I HMS8310 **and** Veterinary Assistant Level II HMS8311 **and** Veterinary Assistant Level III HMS8312
Welding TDI8672/TDI8673/TDI8674	All T&I courses available for the 3-year scheduling option are listed as specializations.	Welding I TDI8672 **and** Welding II TDI8673 **and** Welding III TDI8674 or ICT TDI8904 if needed for local scheduling option

Course/Course Code	Concentration Sequences	Specialization Sequences
Word Processing BUS6625/BUS6626 **Prerequisite:** Keyboarding* * Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills	Word Processing BUS6625, BUS6626* **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to a total of two 36-week courses: • Accounting BUS6320 • Computer Information Systems (CIS) BUS6612/ BUS6614* • Advanced Computer Information Systems BUS6613/BUS6615* (requires CIS prerequisite) • Business Law BUS6131/BUS6132* • Business Management BUS6135/BUS6136* • Computer Applications BUS6611/BUS6617* • Desktop/Multimedia Presentations BUS6630/ BUS6632* • Advanced Desktop/Multimedia Presentations BUS6631/ BUS6633* (requires DTMP prerequisite) • Digital Input Technologies BUS6160*/BUS6161 • Finance BUS6120, BUS6121* • Keyboarding Applications BUS6152/BUS6153* • Keyboarding BUS6151* • Legal Systems Administration BUS6735/BUS6736* • Medical Systems Administration BUS6730/BUS6731* • Notetaking BUS6241, BUS6242* (may complement sequence but must be offered with two or more other courses) • Office Administration BUS6621/BUS6622* • Principles of Business and Marketing BUS6115/ BUS6116* *18-week course*	Word Processing BUS6625/BUS6626* **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses *18-week course*

Course/Course Code	Concentration Sequences	Specialization Sequences
Work and Family Management FCS8205/FCS8282 (This is a transition focus course. It must be combined with family focus or work focus courses to make an approved concentration sequence)	Work and Family Management FCS8205*/FCS8282 **and** a combination of one or more of the following 18-week and 36-week courses, equivalent to two 36-week courses: • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209*/FCS8210 • Life Planning FCS8226*/FCS8227 • Nutrition and Wellness FCS8228*/FCS8229 • Parenting FCS8231*/FCS8232 • Resource Management FCS8214*/FCS8219 • Introduction to Leadership CCN9091* • Leadership Development CCN9092* • Culinary Arts I FCS8275 • Culinary Arts II FCS8276 • Early Childhood Education and Services I FCS8285 • Early Childhood Education and Services II FCS8286 • Family and Human Services I FCS8264 • Family and Human Services II FCS8265 • Fashion Design Occupations I FCS8280 • Fashion Design Occupations II FCS8281 • Hospitality Services I FCS8202 • Hospitality Services II FCS8203 • Interior Design I FCS8295 • Interior Design II FCS8296 *18-week course*	Work and Family Management FCS8205*/FCS8282 **and** a combination of one or more 18-week and 36-week courses listed for concentration, equivalent to a total of three 36-week courses

Section 4: Certification/License/Assessment Overviews

Section 4 includes overviews of all certifications, licenses, and assessments approved by the Virginia Board of Education as part of the requirements for student-selected verified credit and certain diploma seals.

You will find all the certifications, licenses, and assessments listed alphabetically. Each overview supplies
- title and brief description
- how to earn it
- provider
- preparatory courses or course sequence(s).

Students who complete some CTE courses or course sequences may take the associated NOCTI (National Occupational Competency Testing Institute) assessment to fulfill requirements for a student-selected verified credit.

If you need more information about student-selected verified credit, see Section 5.

If you need more information about the Career and Technical Education Seal, see Section 6.

If you need more information about the Advanced Mathematics and Technology Seal, see Section 7.

Section 4: Certification/License/Assessment Overviews

Note: Information Technology certifications may be designated as follows:
*Considered an entry-level certification
**Considered a mid-level certification; may require significant curriculum mapping
***Considered an advanced-level certification; will need to be mapped to curriculum at the academy level

Title/Description	How To Earn It	Provider	Preparatory Courses
A+ Certification* Certification of competency of entry-level computer service technicians. This is a popular first certification, especially for people who want to enter the Information Technology (IT) job market.	Pass the following tests: • A+ Operating System Technologies examination • A+ Core Hardware Service Technician examination	CompTIA	Choose one of the following: • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651 • Computer Systems Technology TDI8622/8623/8624 • Electronics Systems I DTE8416/8417 • Electronics Systems II DTE8412 • Information Technology Fundamentals BUS6670
ACCESS Certification of knowledge and skill in culinary arts	Pass a written exam focusing on application of concepts and tasks performed by chefs and cooks (either food/meal or pastry specialty).	American Culinary Federation, Inc. (ACF)	Choose one of the following: • Culinary Arts TDI8521/8522/8523 • Culinary Arts II FCS8276
Adobe Certified Expert* Certification of a candidate who has passed an Adobe Product Proficiency Exam for a specific Adobe software product. The certified user is considered to be an expert-level user of the software product.	Pass a 1-2 hour product proficiency exam on desired Adobe software product. Exams are computer-delivered, closed-book tests consisting of 60-90 multiple-choice questions. Examples of exams: Adobe Acrobat 5.0, Adobe After Effects 4.1, Adobe FrameMaker 7.0, Adobe GoLive 6.0, Adobe Illustrator 10.0, Adobe InDesign 2.0, Adobe Photoshop 6.0, Adobe Premiere 6.0, Adobe LiveMotion 1.0, Adobe PageMaker 7.0	Adobe Systems, Incorporated	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Graphic Imaging Technology TDI8660/8661/8662
Advanced Concepts of Business and Marketing Certificate Certification awarded for advanced levels of competency, based on business-derived standards, in core business concepts and skills (marketing emphasis) and knowledge of specific business/marketing functions (e.g., selling or industries such as retail or hospitality)	Pass a knowledge-based exam consisting of 125 multiple-choice test items. Test includes items from the following areas: business administration, communication, distribution, economics, financing, marketing-information management, pricing, product management, professional development, promotion, and selling.	ASK Institute (DECA/MarkED)	Choose one of the following: • Advanced Marketing MKT8130/8131 • Advanced Fashion Marketing MKT8145/8146

Title/Description	How To Earn It	Provider	Preparatory Courses
Advertising Design Assessment Occupational competency assessment of skills and knowledge covered for an instruction program focusing on the advertising design job market sector	Pass the NOCTI knowledge-based exam (2019) consisting of 193 test items. Test includes color, reproduction, typography, tools and equipment, printing surfaces, drawing/illustration, production, computer literacy, photography, communication, skills, and design.	National Occupational Competency Testing Institute (NOCTI)	Advertising Design TDI8570/8571/8572
Agriculture Mechanics Assessment An occupational competency assessment of skills and knowledge covered in a typical Agricultural Mechanics course	Pass the NOCTI knowledge-based exam (1002) consisting of 175 test items. Test includes orientation and safety, agricultural mechanic skills, agricultural power and machinery, agricultural electrical power and processing, agricultural structures, and soil and water treatment.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Agricultural Power and Equipment ANR8016 • Agricultural Mechanization Sales and Service ANR8018
Air Conditioning Certification The basis for all other certifications involving the vapor compression refrigeration system. Today's systems use new refrigerants and oils compared to units built just a few years ago. Any technician responsible for diagnosis and repair must possess a strong background in refrigeration systems.	Pass a written exam focusing on the following: theory of heat, temperature and pressure; physical states of matter and change of state; refrigeration and refrigerants; refrigerant and oil management; refrigeration applied to air conditioning, leak detection, tubing and piping practices, system evacuation, system charging, tool usage and calibration, equipment maintenance, and safety.	HVAC Excellence	Heating, Ventilation, Air Conditioning, and Refrigeration TDI8503/8504/8505
Air Cooled Gas Engine Assessment Occupational competency assessment of skills and knowledge covered in a typical Small Engine Repair course	Pass the NOCTI knowledge-based exam (2068) consisting of 200 test items. Test includes fuel system, lubricating system and carburetion, compression, ignition, governor, engine disassembly, engine assembly, maintenance, engine technology, failure, and starters.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Small Engine Repair ANR8021/8082 • Small Engine Repair TDI8725/8726/ 8727
Audio-Visual Communications Assessment Occupational competency assessment of skills and knowledge covered in an introductory course in audiovisual production and communication	Pass the NOCTI knowledge-based exam (2005) consisting of 196 test items. Test includes photo-graphy, computer-based technology, film/video production, audio production, presentation tech-nology, creative development, visual design, project management, equipment maintenance and trouble-shooting, network technology, and related information.	National Occupational Competency Testing Institute (NOCTI)	Television Production TDI8688/8689/8690
AutoCAD 2000 Hands-on measure of ability and knowledge to design in two dimensions, using the AutoCAD 2000 software program	Pass an online knowledge and software use assessment that covers getting started/organization, creating objects, drawing, editing, layers, color and line types, text, dimensioning, blocks, attributes and Xrefs, printing and plotting, and utilities.	Brainbench	Choose one of the following: • Technical Drawing and Design DTE8435/8494 • Engineering Drawing and Design DTE8436/8493 • Architectural Drawing and Design DTE8437/8492 • Drafting TDI8530/8531/8532

Title/Description	How To Earn It	Provider	Preparatory Courses
Automotive Technician Certification of skill in automobile service and repair	Pass at least one of eight specialty exams in engine repair, automatic transmission and transaxle, manual drive train and axles, suspension and steering, brakes, electrical and electronic systems, heating and air conditioning, or engine performance. Verified credit will be awarded for the passing of each certification specialty examination (up to a maximum of four).	National Institute for Automotive Service Excellence (ASE)	Automotive Service Technology—Certified TDI8506/8507/8508
BICSI Registered Installer, Level 1 Cabling certification based on *BICSI Telecommunications Cabling Installation Manual,* 2ⁿᵈ ed.	• Pass a written 2-hour exam made up of 85 multiple choice or true/false questions. The Level 1 passing score is 60%. • Pass a hands-on test, successfully completing two Level 1 Installer tasks to industry standards. This portion of the exam takes approximately 20 minutes per task.	BICSI (International Telecommunications Association)	Electricity and Cabling TDI8533.8534.8535
Brainbench Adobe Illustrator Certification* Certification of knowledge and skill sets required for using the software tool Adobe Illustrator 8.0	Pass an assessment of competencies required to use Adobe Illustrator 8.0 as a software tool. Designed for experienced users, this test includes the following topics: color images, image basics, printing, text, and general knowledge.	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Graphic Imaging Technology TDI8660/8661
Brainbench Adobe PageMaker Certification* Certification of knowledge and skill sets required for using the software tool Adobe PageMaker 6.5	Pass an assessment of specific competencies required to use Adobe PageMaker 6.5 as a software tool. Designed for experienced users, this test includes the following topics: advanced features, color, document layout, graphics, linked files, outputting/exporting, portability, typography, and user interface.	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Graphic Imaging Technology TDI8660/8661/8662
Brainbench Adobe Photoshop Certification* Certification of knowledge and skill sets required for using the software program Adobe Photoshop. Various assessments are available, depending on software version (e.g., 5.5, 6.0, 7.0)	Pass an assessment of specific competencies required to use Adobe Photoshop software. Designed for experienced users, this test includes the following topics if using Version 7.0 assessment: color, drawing and editing, efficiency, image control, layers, masks and channels, painting and retouching, saving and exporting, text, and the work area.	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Graphic Imaging Technology TDI8660/8661/8662

Title/Description	How To Earn It	Provider	Preparatory Courses
Brainbench Certified Internet Professional: Page Layout Certification** Measure of skills in the specific area of Web design. The skills used in page layout for the Web include navigation, layout, use of links, windows, forms, and short cuts. Certification is targeted toward individuals who design the page structures that ensure the ease of navigation and organization of information of professional Web sites.	Pass the following three examinations administered online by Brainbench: • Web Design Concepts • An application-specific exam (e.g., Brainbench Dreamweaver exam), • An elective exam from a specific list of options such as Fireworks, Flash, Director, FrontPage 2000, HomeSite, CorelDRAW, or Photoshop	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631
Brainbench CorelDRAW Certification* A certification of knowledge and skill sets required in using the software program, CorelDRAW 9.0.	Pass an assessment of specific competencies required to use CorelDRAW 9.0 software. Designed for experienced users, this test includes the following topics: colors and palettes; creating objects; effects; file I/O; manipulating objects; preparing for Web, print, and pdf; special features; user interface; working with bitmaps; and working with text.	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Graphic Imaging Technology TDI8660/ 8661/8662
Brainbench Dreamweaver Certification* A certification of knowledge and skill sets required in using the software program, Dreamweaver. Various assessments are available, depending on software version (e.g., 3.0, 4.0, MX).	Pass an assessment of specific competencies required to use Dreamweaver software to develop Web sites. Designed for experienced users, this test includes the following topics if using Version 4.0: addition of interactivity, application environment, collaboration, customizing and extending, media, page authoring, page design, page management, and site management.	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Graphic Imaging Technology TDI8660/ 8661/8662
Brainbench Fireworks Certification* A certification of knowledge and skill sets required in using the software program Macromedia Fireworks to develop graphics for the Web. Various assessments are available depending on software version (e.g., 3, 4).	Pass an assessment of specific competencies required to use Macromedia Fireworks software to develop graphics for the Web. Designed for experienced users, this test includes the following topics if using Version 4: animation, behaviors, buttons, design environment, effects, general tools, layers and frames, masks, production techniques, raster, symbols and libraries, text, and vector.	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Graphic Imaging Technology TDI8660/ 8661/8662
Brainbench Flash Certification* A certification of knowledge and skill sets required in using the software program Flash to develop graphics presentations. Various assessments are available depending on software version (e.g., 4, 5, MX).	Pass an assessment of specific competencies required to use Flash software to develop graphics presentations. Designed for experienced users, this test includes the following topics if using Version 5: advanced actions, animation, buttons, movie management, objects, publishing and exporting, sound, and tools.	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Graphic Imaging Technology TDI8660/ 8661/8662

Title/Description	How To Earn It	Provider	Preparatory Courses
Brainbench HTML Certification* Measure of knowledge of coding Web pages using HTML 4.0. Designed for experienced coders, this certification has been endorsed by the International Association of Webmasters.	Pass one two-hour, closed-book, 120-question, multiple-choice examination that covers the following topics: browsers, components, forms, frames, images, links, structure, style sheets, and text.	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631
Brainbench Java 2 Fundamentals Certification* Certification of knowledge and skill sets (fundamental level) required in using the Java 2 programming language in Web development applications.	Pass a test that measures basic knowledge of programming in Java 2. Designed for new programmers, this test covers the following topics: common packages, data manipulation, flow of control, Java basics, OO basics in Java, and Java fundamentals, runtime, and threads.	Brainbench	Choose one of the following: • Advanced Programming BUS6641 • Advanced Database Design and Management BUS6661
Brainbench Java 2 Certification* Certification of knowledge and skill sets (experienced level) required in using the Java 2 programming language in Web development applications	Pass an assessment that tests for specific competencies required to use Java 2 programming language in Web development applications. Designed for experienced programmers, this test covers the following topics: applets, collections API, database programming, enterprise features, exceptions, fundamentals, graphics programming, input method framework, internationalization, Java Beans, Java IDL, JDBC, JFC, language fundamentals, networking, programming, reference objects, RMI, security, standard packages, and threads.	Brainbench	Choose one of the following: • Advanced Programming BUS6641 • Advanced Database Design and Management BUS6661
Brainbench JavaScript Certification* Certification of knowledge and skill sets required in using JavaScript in Web development applications	Pass an assessment that measures knowledge of programming using JavaScript 1.2. Designed for experienced programmers, this test covers the following topics: components, controlling Windows, documents, events and event handlers, functions, integration with other technologies, objects, operators/variables, statements, working with forms, and working with frames.	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631
Brainbench Macromedia FreeHand Certification* Certification of knowledge and skill sets required in using the vector-drawing software tool Macromedia FreeHand 9	Pass an assessment that tests for specific competencies required to use Macromedia FreeHand 9 as a vector-drawing software tool. Designed for experienced users, this test includes the following topics: document window; organization; drawing; perspective; modifying shape and position; modifying objects; modifying attributes; color, strokes, and fills; symbols and instances; layers; text; templates; printing; and working with other applications.	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Graphic Imaging Technology TDI8660/ 8661/8662

Title/Description	How To Earn It	Provider	Preparatory Courses
Brainbench MS FrontPage 2000 Certification* Certification of knowledge and skill sets required in using the Web development software tool MS FrontPage 2000	Pass an assessment that tests for specific competencies required to use MS Front Page 2000 as a Web-development software tool. Designed for experienced users, this test includes the following topics: creating and managing Webs; creating tables and forms; creating Web pages; FP/client compatibility; Front Page components; general knowledge; media; publishing Web sites; site analysis, design, and maintenance; templates, wizards, tasks, and frames; Web servers, server management, and server extensions; and Web technologies.	Brainbench	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Graphic Imaging Technology TDI8660/ 8661/8662
Brainbench Quark Xpress Certification* Certification of knowledge of Quark Xpress 4--a leading electronic publishing software product used to create, design, and deliver high-impact publications in both print and electronic media.	Pass a two-hour, closed book, 120-question, multiple-choice exam. The exam covers the following topics: character formatting, color management, configuring and customizing, document management, graphics, miscellaneous, object placement, page layout, paragraph formatting, printing and output, text editing, and text/picture boxes.	Brainbench	Graphic Imaging Technology TDI8660/ 8661/8662
Cabinetmaking Assessment Occupational competency assessment of skills and knowledge covered in an instructional program in cabinetmaking	Pass the NOCTI knowledge-based exam (1014) consisting of 168 test items. Test includes: safety, power sawing, drill and drill press, jointer and planer, router and shaper, constructing joints, basic fastening, sanding and finishing, casework design and layout, cutting and shaping casework components, assembling and installing casework, finishing surfaces, transporting and installing casework, and wood lathe.	National Occupational Competency Testing Institute (NOCTI)	Cabinetmaking TDI8604/8605/8606
Carpentry Assessment Occupational competency assessment of skills and knowledge covered for an instructional program in carpentry	Pass the NOCTI knowledge-based exam (2015) consisting of 140 test items. Test includes hand tools, power tools, blueprints and specifications, building materials and fasteners, measuring and layout operations, foundation, forms and concrete, rough framing, exterior finish, interior finish, basic mathematics, and interior system installation.	National Occupational Competency Testing Institute (NOCTI)	Carpentry TDI8601/8602/8603
Carpentry, Level 1 Certification Certification of knowledge and skills defined as Level 1 competency in the carpentry trade area. The certification exam is based the NCCER *Contren Learning Series* standardized curriculum.	Pass an exam that covers the following: orientation to the trade; wood building materials, fasteners, and adhesives; hand and power tools; floor systems; wall and ceiling framing; roof framing, windows, and exterior doors.	National Center for Construction Education and Research (NCCER)	Choose one of the following: • Building Trades TDI8515/8516/8517 • Carpentry TDI8601/8602/8603

Title/Description	How To Earn It	Provider	Preparatory Courses
Certification for Legal Professionals (ALS) Entry-level certification as an accredited legal professional	Pass an exam with three components: 1) written communication; 2) office procedures and legal knowledge; and 3) ethics, human relations, and judgment.	The Association for Legal Professionals	• Accounting BUS6320 or Advanced Accounting BUS6321 **and** • Office Administration BUS6621 **and** • Legal Systems Administration BUS6735
Certification in Convergent Network Technologies (CCNT)* Certification of knowledge of data convergence, computer telephony, and telecommunications	Pass the following six knowledge-based exams: Local Area Networks (LAN) • Basic Telecommunications • Basic Data Communications • Computer-Telephony Integration (CTI) Essentials • Voice Over IP Essentials • Broadband Technologies	ProsoftTraining	Choose one of the following: • Advanced Computer Information Systems BUS6613 • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651
Certified Computer Service Technician (CST) Certification of skill in and knowledge of basic computer electronics as applied to computer operation, maintenance, and repair	Pass the written CST certification examination, demonstrating knowledge of basic electronics concepts and principles that form the foundation of all other industry specialty knowledge, skills, and abilities; basic computer hardware operations and problems; and general human/customer relations skills.	Electronics Technicians Association, International (ETA)	Choose one of the following: • Computer Systems Technology TDI8622/8623/8624 • Electronics Technology TDI8536/8537/8538
Certified Dental Assistant: Infection Control Examination (ICE) One of three assessments leading to completion of the Certified Dental Assistant credential (CDA)	Pass a knowledge-based exam consisting of 100 multiple-choice questions. The exam includes collection and recording of data, patient and dental health care work education, prevention of cross-contamination and transmission, maintaining aseptic conditions, selecting disinfection or sterilization, performing sterilization procedures, performing disinfection procedures, occupational safety.	Dental Assisting National Board, Inc.	Dental Assistant HMS8328/8329
Certified Dental Assistant: Radiation Health & Safety Examination (RHS) One of three assessments leading to complete the Certified Dental Assistant credential (CDA)	Pass a knowledge-based exam consisting of 100 multiple-choice questions. The exam includes the expose and evaluate (intraoral, extraoral), process, mount/label, radiation safety-patient, radiation safety-operator, storage and disposal, quality assurance.	Dental Assisting National Board, Inc.	Dental Assistant HMS8328/8329

Title/Description	How To Earn It	Provider	Preparatory Courses
Certified Electronics Technician Associate (CETA) The CETA Program is designed for entry-level electronics students, apprentices, or technicians with two years or fewer combined electronics training and/or work experience. It certifies a knowledge of basic electronics concepts and principles that form the foundation of all other industry specialty knowledge, skills, and abilities. This exam is the basic portion of the advanced journey-level certification exam covering basic electricity, electronics, math, AC & DC circuits, transistors, and basic trouble-shooting skills.	This exam is the basic portion of the full credit journey-level certification exam. This multiple-choice exam covers basic electricity, electronics, math, AC & DC circuits, transistors, and basic troubleshooting skills. The Associate level exam is a two-hour exam, and the applicant must receive a score of 75% to pass.	Electronics Technicians Association, International (ETA)	Electronics Technology TDI8536/8537/8538 Electronics Systems I DTE8416/8417 Electronics Systems II DTE8412
Certified Fiber Optics Installer Certification for technicians capable of fabricating, installing, troubleshooting, and maintaining fiber optic cable infrastructure	Complete an instructional unit consisting of the "Certified Fiber Optics Installer" curriculum from The Association of Communications & Electronics Schools, International. Pass an examination based on the following areas: particle and wave theories, optical fiber basics, connectors and components, splicing and cabling installation, optical signal concepts, troubleshooting, and hands-on skills,, fiber optics connectorization, splicing & testing.	The Association of Communications & Electronics Schools, International	Electricity and Cabling TDI8533/8534/8535
Certified Hospitality Supervisor (CHS) Certification of superior administrative skills in the hospitality industry. Related curriculum from the American Hotel and Lodging Association (AH&LA) must be completed	• Pass an exam (made up of 125 multiple-choice questions) designed for entry-level supervisors just beginning their careers. • Complete the related course of study from the American Hotel and Lodging Association. • Secondary students can take certification exam after completing course work (and before graduation) before completing certification requirement of 90 days of on-the-job experience.	American Hotel and Lodging Association (AH&LA)	Choose one of the following: • Hotel/Motel Marketing MKT8160/8161 • Advanced Hotel/Motel Marketing MKT8162/8163 • Hospitality Services II FCS8203

Title/Description	How To Earn It	Provider	Preparatory Courses
Certified Internet Webmaster Associate Certification* Certification of basic skills and knowledge that an Internet professional is expected to understand and use. This is the first step in the Certified Internet Webmaster (CIW) program.	Pass a CIW Foundations exam (1DO-410). The exam covers Internet fundamentals, Web page authoring fundamentals, and networking fundamentals. ProsoftTraining accepts the iNet+ exam from CompTIA as a substitute for the CIW Foundations exam.	ProsoftTraining	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop Multimedia Presentations BUS6631 • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651 • Programming BUS6640 • Advanced Programming BUS6641
Certified Internet Webmaster Professional* Second certification step in the Certified Internet Webmaster program of certifications. Indicates that an individual has achieved the Certified Internet Webmaster Associate certification and has passed one additional job-role related exam in one of the CIW certification tracks.	Pass the foundation exam for the CIW Associate certification. Pass one job-role related exam in one of the Certified Internet Webmaster (CIW) certification tracks.	ProsoftTraining	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop Multimedia Presentations BUS6631 • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651 • Programming BUS6640 • Advanced Programming BUS6641
Certified Novell Administrator (CNA)* Certification of skills and knowledge for individuals who handle the day-to-day administration of an installed Novell networking product. The CNA is the first step in the Novell certification program.	Pass the Novell exam 050-677, Foundations of Novell Networking. This exam covers topics such as directory services, security, Web services, LAN/WAN technologies, and client/server management.	Novell	• Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651
Certified Satellite Dish Installer Certification of skill in and knowledge necessary to install earth station, TV receive-only satellite dishes for consumer, business, and government use	Pass a test that includes antenna theory, amplifiers, satellite components, reflectors, feeds, wiring and switching, cabling, installation, interfacing, MATV and SMATV systems, fiber optics, and troubleshooting.	Electronics Technicians Association, International (ETA)	Choose one of the following: • Electronics Technology TDI8536/8537/8538 • Electricity and Cabling TDI8533/8534/8535

Title/Description	How To Earn It	Provider	Preparatory Courses
Child Development Associate (CDA) Certification of skill and knowledge related to early childhood caregiver in the following programs: infant/toddler, preschool center, family childcare, or home visitor	• Complete 120 clock hours of formal child care education. Submit documents to be evaluated: a professional resource file, parent opinion questionnaires, and the CDA assessment observation instrument. • Participate in an oral interview conducted by a Council representative. • Pass a written exam concentrating on a safe, healthy learning environment; physical, intellectual, social, and emotional development of children; productive relationships with families; effective program operation; commitment to professionalism; observation and recording of children's behavior; and principles of child development and learning. • Be at least 18 years of age.	Council for Professional Recognition	Early Childhood Education FCS8285/8286
Cisco CCNA Academy Certificate (CCNA: 1) Certificate of successful completion of the CCNA 1: Networking Basics course of the CISCO Network Academy Program leading to full certification, Cisco Certified Network Associate (CCNA)	Pass an online assessment of competency in the following areas: introduction to networking, networking fundamentals, networking media, cable testing, cabling LANs and WANs, Ethernet fundamentals, Ethernet technologies, Ethernet switching, TCP/IP Protocol Suite, IP addressing, routing fundamentals and subnets, and TCP/IP transport and application layer.	Cisco Systems	Computer Networking Hardware Operations I TDI8542
Cisco CCNA Academy Certificate (CCNA: 2) A certificate of successful completion of the CCNA 2: Router and Routing Basics course of the CISCO Network Academy Program leading to full certification, Cisco Certified Network Associate (CCNA)	Pass an online assessment of competency in the following areas: WANs and routers, introduction to routers, configuring a router, learning about other devices, managing Cisco IOS software, routing and routing protocols, TCP/IP Suite error and control messages, basic router troubleshooting, intermediate TCP/IP, and access control lists (ACLs).	Cisco Systems	Computer Networking Hardware Operations II TDI8543
Cisco CCNA Academy Certificate (CCNA: 3) A certificate of successful completion of the CCNA 3: Switching Basics and Intermediate Routing course of the CISCO Network Academy Program leading to full certification, Cisco Certified Network Associate (CCNA)	Pass an online assessment that indicates competency in the following areas: introduction to classless routing, single-area OSPF, EIGRP, switching concepts, switches, switch configuration, spanning tree protocol, virtual LANs, and virtual trunking protocol.	Cisco Systems	Computer Networking Hardware Operations III TDI8544
Cisco CCNA Academy Certificate (CCNA: 4) A certificate of successful completion of the CCNA 4: WAN Technologies course of the CISCO Network Academy Program leading to full certification, Cisco Certified Network Associate (CCNA)	Pass an online assessment that indicates competency in the following areas: scaling IP addresses, WAN technologies, PPP, ISDN and DDR, frame relay, introduction to network administration, optical networking fundamentals.	Cisco Systems	Computer Networking Hardware Operations IV TDI8545

Title/Description	How To Earn It	Provider	Preparatory Courses
Cisco Certified Networking Associate (CCNA) Entry-level certification for workers who install, configure, and operate simple-routed LAN, routed WAN, and switched LAN, and ATM LANE networks that use Cisco routers and switches	Complete the following courses as a part of the CISCO Network Academy Program: CCNA 1: Networking Basics, CCNA 2: Router, CCNA 3: Switching, CCNA 4: WAN Technologies. Pass one CISCO certification exam, CCNA Exam 640-507.	Cisco Systems	Computer Networking Hardware Operations TDI8542/8543/8544/8545
Clothing and Textiles Management and Production Assessment Occupational competency assessment of skills and knowledge related to basic fashion design	Pass the NOCTI knowledge-based exam (1018) consisting of 156 test items. Test includes construction, alterations, textiles, design and color, mathematics, pattern making, manufacturing, sewing machine and fasteners.	National Occupational Competency Testing Institute (NOCTI)	Fashion Design Occupations FCS8281
Collision Repair and Refinishing Technician (ASE) Certification of automotive body and accessory repair technicians who meet ASE standards in automotive damage repair services.	Pass one of four tests covering structural analysis and damage repair, nonstructural analysis and damage repair, mechanical and electrical component repair, and painting and refinishing. Present proof of two years of relevant work experience. Three full years of training, either in automobile/truck/school bus repair or in collision repair, refinishing, or damage estimating may be substituted for one year of work experience.	National Institute for Automotive Service Excellence (ASE)	Automotive Body Technology—Certified TDI8676/8677/8678
Commercial Air Conditioning Certification Certification that addresses unique issues involved in the service and maintenance of commercial air conditioning systems. Commercial air conditioning technicians are faced with a variety of equipment and systems. All A/C equipment has certain components and functions that are common to all refrigeration and A/C devices; however, commercial buildings may experience high occupancy and contain a variety of equipment leading to indoor air quality (IAQ) concerns.	Pass a written exam focusing on the following: commercial evaporators, commercial condensing units, head pressure controls, charging commercial systems, air distribution, fresh air intake and exchange, filtration (HEPA filters, electronic air filters, activated charcoal air purifiers), generators, humidity control, control of indoor contamination, and duct cleaning.	HVAC Excellence	Heating, Ventilation, Air Conditioning, and Refrigeration TDI 8503/8504/8505
Commercial Foods Assessment Occupational competency assessment of skills and knowledge related to commercial foods operations	Pass the NOCTI knowledge-based exam (2020) consisting of 182 test items. Test includes food service overview, sanitation, safety, equipment, production techniques, recipes, purchasing and management skills, menu planning and service.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Culinary Arts II FCS8276 • Culinary Arts TDI8521/8522/8523

Title/Description	How To Earn It	Provider	Preparatory Courses
Commercial Refrigeration Certification Certification for technicians servicing or maintaining commercial or industrial refrigeration systems. The commercial refrigeration technician is faced with a variety of equipment and an equal variety of trouble-shooting and service situations. Electrical and Air Conditioning Certifications are prerequisite to the Commercial Refrigeration Exam.	Pass a written exam focusing on the following: refrigeration components, commercial evaporators, commercial condensing units (head pressure controls), charging commercial systems, refrigerant controls, ice maker controls, defrost timers, pressure regulating values, grocery (reach-in) cabinets, walk-in cabinets, display cases, frozen food storage, dispensing freezers, and industrial applications.	HVAC Excellence	Heating, Ventilation, Air Conditioning, and Refrigeration TDI 8503/8504/8505
Construction Electricity Assessment Occupational competency assessment of skills and knowledge covered in an instructional program in construction electricity	Pass the NOCTI knowledge-based exam (1024) consisting of 186 test items. Test includes: safety, tools, and equipment, NEC/blueprints/planning/ layout, electronics, alternating current (basic theory, circuits, three-phase), transformers, AC motors and starters, branch circuits, wiring methods, lighting, heating and air conditioning and low voltage.	National Occupational Competency Testing Institute (NOCTI)	Electricity and Cabling TDI8533/8534/8535
Construction Fundamentals Certification Certification of knowledge and skills defined as *construction fundamentals* for all building and construction trade areas. The certification exam will be based upon the NCCER *Contren Learning Series* standardized curriculum.	Pass an exam that covers the following: basic safety, introduction to construction math, introduction to hand tools, introduction to power tools, introduction to blueprints, and basic rigging.	National Center for Construction Education & Research (NCCER)	Choose one of the following: • Building Trades TDI8515/8516/8517 • Carpentry TDI8601/8602/8603 • Cabinetmaking TDI8604/8605/8606 • Electricity and Cabling TDI8533/8534/8535 • Masonry TDI8512/8513/8514 • Plumbing TDI8551/8552/8553
Construction Masonry—Blocklaying Assessment Occupational competency assessment of skills and knowledge covered in an instructional program in masonry-blocklaying	Pass the NOCTI knowledge-based exam (2025) consisting of 187 test items. Test includes hand and power tools, safety, materials and methods, blueprints and specifications, masonry layout and applications, fireplaces and chimneys, masonry structure maintenance, scaffolding, trade appreciation and human relations, arches, steps, patios and pattern bonds and specialty area of blocklaying.	National Occupational Competency Testing Institute (NOCTI)	Masonry TDI8512/8513/8514
Construction Masonry—Bricklaying Assessment Occupational competency assessment of skills and knowledge covered in an instructional program in masonry-bricklaying	Pass the NOCTI knowledge-based exam (2125) consisting of 187 test items. Test includes hand and power tools, safety, materials and methods, blue-prints and specifications, masonry layout and applications, fireplaces and chimneys, masonry structure maintenance, scaffolding, trade appre-ciation and human relations, arches, steps, patios and pattern bonds and specialty area of bricklaying.	National Occupational Competency Testing Institute (NOCTI)	Masonry TDI8512/8513/8514

Title/Description	How To Earn It	Provider	Preparatory Courses
Consumer Electronics Certification (CEC) Certification of knowledge and skill for consumer electronics service technicians in operations, servicing, and repair of consumer electronics products	• Pass the ETA Associate Certified Electronics Technician (ACET) core exam as prerequisite. • Pass exam for this specialty (one of several journey-level specialty options) that focuses on the operation and mechanics of TV, radio, VCR, and other consumer electronics products; TV and radio frequencies and their uses; power supplies; video and audio circuitry; and assembly and disassembly of products.	Electronics Technicians Association, International (ETA)	Electronics Technology TDI8536/8536/8537
Copper Based Cabling Certification A certification for technicians capable of fabricating, installing, troubleshooting, and maintaining copper cable infrastructure for high speed data services, voice, video, and security information systems. Instructor must be RBT System certified before students can receive certification.	• Complete an instructional unit consisting of an RBT Copper Based Network Cabling Certification module. • Pass an examination covering the following areas: safety, hardware, twisted pair cabling and coaxial cabling, cable testing, cabling standards, network cabling installation, and residential and voice cabling.	RBT Systems, Inc.	Electricity and Cabling TDI 8533/8534/8535
Cosmetology Virginia state license to practice the care and styling of human hair, wigs, and hairpieces	• Complete the training required by the licensing board as defined in the Code of Virginia. • Pass the written and performance elements of Virginia licensing examination.	Virginia Board of Cosmetology (Department of Professional & Occupational Regulations)	Cosmetology TDI 8527/8528/8529
Customer Support Specialist Certification* Certification of knowledge of customer service, skills required, and readiness to work in the support center industry. A candidate who passes the certification exam is expected to understand the role of the support center professional, best practices for communications, customer service, teamwork, ethics, support center processes, and terminology.	Pass a one-hour, 40-question exam covering the following areas: customer support profession, communications, customer service, problem solving, teamwork, ethics, technical processes, and technology & infrastructure.	Help Desk Institute	Choose one of the following • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations TDI6651
Damage Analysis and Estimating Certification (ASE) A certification program to identify and recognize those estimators who possess knowledge of the skills required to properly analyze and estimate automotive collision damage	• Pass the ASE Damage Analysis and Estimating Test in the Collision Repair Test series, which identify and recognize collision repair technicians and refinishers. • Present proof of two years of relevant work experience that must be related to damage analysis and estimating, not hands-on collision repair. • May substitute two years of formal training for one year of work experience.	National Institute for Automotive Service Excellence (ASE)	Automotive Body Technology—Certified TDI8676/8677/8678

Title/Description	How To Earn It	Provider	Preparatory Courses
Dental Assisting Assessment Occupational competency assessment of skills and knowledge covered in a dental assisting instructional program.	Pass the NOCTI knowledge-based exam (2026) consisting of 183 test items. Test includes communication, infection control and hazards management, assisting with clinical procedures, performing diagnostic measures and performing clerical functions.	National Occupational Competency Testing Institute (NOCTI)	Dental Assistant HMS8329
Drafter Certification A certification that allows drafters to demonstrate drafting concepts and nationally recognized standards and practices. The certification exam does not require specific knowledge of design and does not cover software specific computer aided drafting (CAD).	Pass an exam that covers drafting concepts as well as nationally recognized standards and practices.	American Design Drafting Association	Drafting TDI8530/8531/8532
Early Childhood Care & Education Assessment Occupational competency assessment of skills and knowledge related to instruction in the early childhood care and education area	Pass the NOCTI knowledge-based exam (2016) consisting of 193 test items. Test includes program management, health and safety, intellectual (cognitive) development. Physical development, social and emotional development, positive adult/child relationships and guidance, positive relationships with families, professionalism, language development and communication, creativity, culturally relevant care and education, observation and documentation of learning, inclusion of children with special needs, and curriculum planning.	National Occupational Competency Testing Institute (NOCTI)	Early Childhood Education FCS8285/8286
Electrical Certification Certification for the HVAC technician who installs, services, troubleshoots, and repairs a variety of electrical circuits and components in today's HVAC systems. Because the vast majority of service calls involve electrical repairs, HVAC Excellence designates Electrical Certification the prerequisite for all other certifications in its program. Other certifications may contain questions that are electrical in nature, but are specific to that type of equipment.	Pass a written exam focusing on circuit fundamentals, electrical materials, magnetism, circuit protection, automatic controls components and applications, troubleshooting basic controls, types of electric motors, application of motors, motor controls, and troubleshooting electric motors.	HVAC Excellence	Heating, Ventilation, Air Conditioning, and Refrigeration TDI8503/8504/8505

Title/Description	How To Earn It	Provider	Preparatory Courses
Electric Heat Certification Certification for a technician who services electric heat systems or heat pump systems. It demonstrates competence in all aspects of service and troubleshooting electric heat systems. Electric heat is commonly used as a supplemental heat supply for heat pump systems, hence, it is an excellent supporting certification. Electrical Certification is prerequisite to the Electric Heat exam.	Pass a written exam focusing on the following: principles of electric resistance heating, central forced air electric furnaces, thermostats, controlling multiple stages, contractors for electric furnaces, wiring diagrams, fan motor circuits, and airflow.	HVAC Excellence	Heating, Ventilation, Air Conditioning, and Refrigeration TDI 8503/8504/8505
Electrical, Level 1 Certification Certification of knowledge and skills defined as Level 1 competency in the residential and commercial/industrial electrical trade area. The certification exam will be based upon the NCCER *Contren Learning Series* standardized curriculum.	Pass an exam that covers the following: electrical safety; hand bending; fasteners and anchors; electrical theory one; electrical theory two; electrical test equipment; introduction to the national electrical code; raceways, boxes, and fittings; conductors; introduction to electrical blueprints; wiring: commercial and industrial; wiring: residential.	National Center for Construction Education & Research (NCCER)	Choose one of the following: • Electricity and Cabling TDI8533/ 8534/8536 • Building Trades TDI8515/8516/8517
Emergency Medical Technician Certification for emergency medical technician (EMT) or first responder	Pass the written and practical elements of a test focusing on emergency treatment of victims of accident, injury, or illness.	Department of Health, Office of Emergency Medical Services	Emergency Medical Technology HMS8333/8334
EPA Technician Certification (Exams: Core, I, II, or III) Certification that is required by Section 608 of the Clean Air Act for anyone who maintains, services, repairs, or disposes of appliances which contain refrigerants with CFCs or HCFCs. Certification must be administered by an EPA-approved testing organization (e.g., Air Conditioning and Refrigeration Institute—ARI).	Pass testing required to obtain the mandatory EPA Technician Certification. Includes a complete review of the final EPA regulations implementing Section 608 of Clean Air Act. Recovery, recycling, reclamation, and proper handling of refrigerants and other information needed.	Environmental Protection Agency (Authorized Testing Entity)	Heating, Ventilation, Air Conditioning, and Refrigeration TDI8503/8504/8505
Fiber Optic Network Cabling Certification A certification for technicians capable of fabricating, installing, troubleshooting, and maintaining fiber optic cable infrastructure for high speed data services (broadband, LAN, gigabit ethernet, VoIP, xDSL and ATM), voice, video, and security information systems. Instructor must be RBT System-certified before students can receive certification.	• Complete an instructional unit consisting of an RBT Fiber Optic Network Cabling Certification module. • Pass an examination covering the following areas: fiber optic fundamentals, history of fiber optics, safety, fiber optic tools, fiber optic concepts, cable assemblies, cabling system design, cabling system installation, connecting methods and devices, connecting hardware and outlets, testing, troubleshooting, and standards.	RBT Systems, Inc.	Electricity and Cabling TDI8533/8534/8535

Title/Description	How To Earn It	Provider	Preparatory Courses
Fiber Optics Installer Certification Entry-level certification for fiber optics installers. Program establishes and benchmarks the basic knowledge and skills needed to install fiber optics communications cabling safely and competently.	• Attend an ETA-approved Fiber Optics Installer School (or program). • Successfully complete a hands-on demonstration of splicing and connectorization ability as it applies to fiber optics cable. • Pass written FOIC certification examination.	Electronics Technicians Association, International (ETA)	Electricity and Cabling TDI8533/8534/8535
Food Production, Management, and Services Assessment Occupational competency assessment of skills and knowledge related to basic culinary arts instruction	Pass the NOCTI knowledge-based exam (2036) consisting of 185 test items. Test includes recipes; large and small equipment; sanitation and safety; preparation of cold food, vegetables, starches and proteins, bakery, desserts, pastries, stocks, sauces, soups, meats, poultry, seafood, and breakfast; receiving and storage; nutritional values; customer service and management; and employment skills.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Culinary Arts II FCS8276 • Culinary Arts TDI8521/8522/8523
Forestry Products & Processing Assessment Occupational competency assessment of skills and knowledge covered in courses such as Introduction to Natural Resources and Forestry, Wildlife, and Soil Management	Pass the NOCTI knowledge-based exam (2037) consisting of 157 test items. Test includes general safety, logging/harvesting, tree identification, forest protection, silvaculture, forest management, business management, wildlife, surveying, chain saw, sawmilling, diesel—hydraulics, employability skills, forest ecology, and timber cruising.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Introduction to Natural Resources ANR8040 • Forestry, Wildlife, and Soil Management ANR8042
Fundamental Concepts of Business and Marketing Certificate Certificate awarded for competency in business concepts and skills (marketing emphasis) based on business-derived standards and for knowledge of specific business/marketing functions (e.g., selling or industries such as retail or hospitality)	Pass a knowledge-based exam consisting of 100 multiple-choice test items. Test includes business administration, communications, distribution, economics, financing, marketing-information management, product management, professional development, promotion, and selling.	ASK Institute (DECA/MarkED)	Choose one of the following • Marketing MKT8120/8121 • Fashion Marketing MKT8140/8141
Gas Heat Certification Gas Heat Certification indicates that a technician possesses an in-depth knowledge of all types of gas heat units and their control systems. Any technician who installs, services, or maintains gas heat systems should be certified. Electrical Certification is prerequisite to the Gas Heat exam.	Pass a written exam focusing on the following: types of furnaces, gas fuels (natural gas, LP gas), combustion, gas valve, automatic combination gas valve, manifold, orifice, burners, pilots, gas furnace wiring diagrams, and troubleshooting techniques.	HVAC Excellence	Heating, Ventilation, Air Conditioning, and Refrigeration TDI8503/8504/8505
Graphic Communications Technology Assessment Occupational competency assessment of skills and knowledge covered in an instructional program for graphics arts, printing, and related digital media.	Pass the NOCTI knowledge-based exam (4042) consisting of 190 test items. Test includes introduction to printing, electronic imaging and copy presentation, image assembly and platemaking, duplicator/press operations, finishing processes, and electronic publishing.	National Occupational Competency Testing Institute (NOCTI)	Graphic Imaging Technology TDI8660/8661/8662

Title/Description	How To Earn It	Provider	Preparatory Courses
Graymark Cable Installation Certification Certification provided to students who have successfully trained on the Graymark Cabling Tech program as taught by a certified instructor. The Cabling Tech program covers all topics required by the industry standard BICSI Level 1 certification plus cable installation such as phone, cable television, and inside and outside installation cable.	• Complete the Graymark Cabling Tech program taught by a teacher certified to teach that curriculum. • Pass an exit exam related to the Graymark Cabling Tech program competencies.	Graymark International	Electricity and Cabling TDI8533/8534/8535
Greenhouse Operators Certification Program Certification of skills and knowledge relating to greenhouse production and marketing	Pass a knowledge-based exam.	Southeast Greenhouse Growers Association	Choose one of the following: • Horticulture Sciences ANR8134 • Floral Design I ANR8055 • Floral Design II ANR8056 • Floriculture II ANR8038 • Greenhouse Plant Production and Management ANR8035 • Specialty Horticulture Arts ANR8037
Heat Pump Certification Certification of competence in all areas of service and troubleshooting air-to-air heat pump systems. Any technician responsible for the installation, service and maintenance of air to air heat pump systems should be Heat Pump Certified. Electrical and Air Conditioning Certifications are prerequisites for this test.	Pass a written exam focusing on the following: theory, operation and components of a reverse cycle heat pump, four-way valves, heat sources for heat pumps, auxiliary heat for heat pumps, heat pump efficiency ratings, co-efficiency of performance, control sequences, maintenance procedures, and safety.	HVAC Excellence	Heating, Ventilation, Air Conditioning, and Refrigeration 8503/8504/8505
Horticulture—Floriculture Assessment Occupational competency assessment of skills and knowledge covered in basic floriculture instruction	Pass the NOCTI knowledge-based exam (2049) consisting of 135 test items. Test includes general knowledge, pest management, fundamentals of irrigation, basic nursery/greenhouse skills, horticulture retailing, greenhouse/floriculture, floral industry, and interiorscaping.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Horticulture Sciences ANR8034 • Floriculture ANR8038
Horticulture—Landscaping Assessment Occupational competency assessment of skills and knowledge covered in basic landscaping instruction	Pass the NOCTI knowledge-based exam (2149) consisting of 131 test items. Test includes general knowledge, pest management, fundamentals of irrigation, basic nursery/greenhouse skills, horticulture retail, landscape construction, landscape maintenance, golf course maintenance, and arboriculture.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Horticulture Sciences ANR8034 • Landscaping ANR8036

Title/Description	How To Earn It	Provider	Preparatory Courses
Horticulture—Olericulture Assessment Occupational competency assessment of skills and knowledge covered in basic greenhouse plant production and management as relates to fruits and vegetables	Pass the NOCTI knowledge-based exam (2249) consisting of 124 test items. Test includes general knowledge, pest management, fundamentals of irrigation, basic nursery/greenhouse skills, horticulture retailing, and fruits and vegetables.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Horticulture Sciences ANR8034 • Greenhouse Plant Production and Management ANR8037
Hospitality Management—Food and Beverage Option Assessment Occupational competency assessment of skills and knowledge related to hospitality industry management with emphasis on food and beverage operations	Pass the NOCTI knowledge-based exam (1079) consisting of 159 test items. Test includes introduction to hospitality management, guest relations/concierge, understanding hospitality marketing, the marketing department, marketing to organizations, safety on the job, cashier, travel and tourism, restaurant management, food and beverage service, and legal and ethical responsibilities.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Advanced Hotel/Motel Marketing MKT8162/8163 • Hospitality Services II FCS8203
Hospitality Management—Lodging Option Assessment Occupational competency assessment of skills and knowledge related to hospitality industry management with emphasis on lodging operations	Pass the NOCTI knowledge-based exam (1080) consisting of 163 test items. Test includes introduction to hospitality management, front office organization, rooms, bedding and rates, the reservation function, guest relations/concierge, understanding hospitality marketing, the marketing department, marketing to organizations, safety on the job, cashier, travel and tourism and legal and ethical responsibilities.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Advanced Hotel/Motel Marketing MKT8162/ 8163 • Hospitality Services II FCS8203
Hospitality Skills Certification—Front Desk Agents Entry-level certification for hotel/motel front desk agents	• Accrue 90 days of on-the-job experience, attaining a satisfactory skill evaluation by the employer.* • Pass a written exam that includes operation of front desk computers, fax machines, and telephone systems; all phases of guest check-in; responses to guest requests and service problems; sales techniques; and report preparation.* *Secondary students can take the curriculum-related exit exam before graduation to qualify for verified credit.	American Hotel and Lodging Association (AH&LA)	Choose one of the following: • Hotel/Motel Marketing MKT8160/8161 • Advanced Hotel/Motel Marketing MKT8162/ 8163

Title/Description	How To Earn It	Provider	Preparatory Courses
Hospitality Skills Certification—Restaurant Servers Entry-level certification for restaurant service staff in the hospitality industry	• Accrue 90 days of on-the-job experience before actual certification can be awarded, attaining a satisfactory skill evaluation by the employer.* • Pass a written exam* that includes stocking side stations and preparing service trays, greeting and seating guests, taking food orders, serving meals, handling dissatisfied guests, selling after-dinner items, and performing closing sidework. *Secondary students can take the curriculum-related exit exam before graduation to qualify for verified credit.	American Hotel and Lodging Association (AH&LA)	Choose one of the following: • Hospitality Services I FCS8202 • Hospitality Services II FCS8203
Hospitality Skills Certification—Room Attendants Entry-level certification for hotel/motel room attendants	• Accrue 90 days of on-the-job experience before actual certification can be awarded, attaining a satisfactory skill evaluation by the employer.* • Pass a written exam* that includes preparing and organizing cart and work areas; performing initial room inspections; cleaning bathrooms and guest rooms; correcting and reporting problems; and completing end-of-shift duties. **Secondary students can take the curriculum-related exit exam before graduation to qualify for verified credit.	American Hotel and Lodging Association (AH&LA)	Choose one of the following: • Hospitality Services I FCS8202 • Hospitality Services II FCS8203
HVAC, Level 1 Certification Certification of knowledge and skills defined as Level 1 competency in the heating, ventilation, and air conditioning area. The certification exam will be based upon the NCCER *Contren Learning Series* standardized curriculum.	Pass an exam that covers basic principles and skills related to the residential and light commercial heating and air conditioning systems.	National Center for Construction Education & Research (NCCER)	Heating, Ventilation, Air Conditioning, and Refrigeration TDI8503/8504/8505
Hydraulics Specialist Certification A certification (3-hour exam) that confirms knowledge in the following areas: fluid power fundamentals, specialized fluid power topics, relay logic, system integration, and electrical control technology. *Fluid power* is the generic term for the use and application of hydraulic, pneumatic, electronic control, or vacuum technology this is used to help operate equipment.	There are no prerequisite work experience requirements to receive the Hydraulic Specialist Certification. However, the fluid power specialist is expected to know basic principles, concepts, and terms; load and motion analysis; system design, analysis and troubleshooting; component applications; and control systems and control components. In addition, the specialist also is expected to have knowledge of fluids, fluid conductors, and fluid filtration as well as air compression and preparation.	Fluid Power Society	Industrial Maintenance Technology TDI8575/8576/8577

Title/Description	How To Earn It	Provider	Preparatory Courses
IC³ (Internet and Computing Core Certification)* A global, validated, standards-based training and certification program for basic computing and Internet literacy. It provides specific guidelines for the knowledge and skills required for basic use of computer hardware, software, networks, and the Internet.	Pass three individual examinations in the following areas: • Computing Fundamentals • Key Applications • Living Online	Certiport	Choose any 36-week Business and Information Technology course **except** Keyboarding, Keyboarding Applications, Digital Input Technologies, or Notetaking,
iNet+ Certification* Certification of essential networking and Internet knowledge and skills of entry-level Internet and e-commerce technical professionals who are responsible for participating in the maintenance of Internet, Intranet, and Extranet infrastructure and services as well as the development of Web-based applications	Pass a written exam that requires knowledge in six domain areas: Internet Basics & Clients, Development, Networking, Internet Security, and Business Concepts.	CompTIA	Choose one of the following: • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651 • Desktop Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631
Installer Core Certification (HVAC-NATE) The Core NATE Installer exam is the first certification required in the installer area before a technician chooses a more advanced specialty installation exam for full certification (passing of core exam and specialty area exam).	Pass a 50-question core exam that covers safety, tools, soft skills, principles of heat transfer and total comfort, and electrical questions.	North American Technician Excellence, Inc. (NATE)	Heating, Ventilation, Air Conditioning, and Refrigeration TDI8503/8504/8505
International Computer Driving License (ICDL)* Computer literacy certification stressing proficiency in seven broad areas	Pass individual examinations in the following seven areas: • Basic Concepts of IT • Using a Computer and Managing Files • Word Processing • Spreadsheets • Databases • Presentations • Information and Communication	ICDL US	Choose any 36-week Business and Information Technology course **except** Keyboarding, Keyboarding Applications, Digital Input Technologies, or Notetaking.
IT Essentials Certificate, Level 1 End-of-course certificate awarded upon successful completion of the curriculum unit, IT Essentials Level 1: PC Hardware and Software, from Cisco Systems. It provides a "stepping stone" preparation to the A+ certification from CompTIA.	Pass one examination covering the following topics: information technology basics, how computers work, assembling a computer, operating systems fundamentals, Windows 9x operating systems, multimedia capabilities, Windows NT/2000/XP operating systems, advanced hardware fundamentals for servers, networking fundamentals, printers and printing, preventive maintenance, troubleshooting PC hardware, and troubleshooting software.	Cisco Systems	Choose one of the following: • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651 • Information Technology Fundamentals BUS6670 • Computer Systems Technology TDI8622/8623/8624

Title/Description	How To Earn It	Provider	Preparatory Courses
IT Essentials Certificate, Level 2 End-of-course certificate awarded upon successful completion of the curriculum unit, IT Essentials Level 2: Network Operating Systems, from Cisco Systems. It provides a stepping stone to the certifications such as Network+, Server+, and Linux+ from CompTIA.	Pass one examination covering the following topics: operating system fundamentals, introduction to networking, physical components of a network, TCP/IP networking, overview of network services, introduction to network operating systems, installation and boot process overview, Windows 2000 Professional, Linux installation procedures, Linux, advanced NOS administration, installing and maintaining hardware in a Linux environment, troubleshooting the operating system, and network security.	Cisco Systems	Choose one of the following: • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651
Java Programming Certificate End-of-course certificate awarded upon successful completion of the course, Fundamentals of Java Programming, from Cisco Systems. It provides a stepping stone to the Sun Certified Programmer for JAVA certification.	Pass an end-of-course online exam which tests the following: conceptual understanding of object oriented programming, Java languages, object-oriented technologies to solve business problems, language fundamentals and Java language API, and creating classes, objects, and applications.	Cisco Systems	Choose one of the following: • Advanced Database Design and Management BUS6661 • Advanced Programming BUS6641
Law Enforcement Assessment Occupational competency assessment of skills and knowledge covered in a program on introductory criminal justice/law enforcement	Pass the NOCTI knowledge-based exam (1081) consisting of 197 test items. Test includes orientation and safety, criminal laws and procedures, arrest and search procedures, investigation/crime scene process, first aid/CPR, basic rights and responsibilities, personal health, hazardous materials/general safety, police concepts and skills, an corrections concepts and skills.	National Occupational Competency Testing Institute (NOCTI)	Criminal Justice TDI8702/8703/8704
Light Commercial Heating & Air Conditioning Industry Competency Exam (ICE) offered by ARI. It measures industry-wide standards of basic competency for entry-level (one-year or less) technicians in the area of light commercial heating and air conditioning (6- to 20-ton systems).	Pass an exam that contains 100 multiple-choice questions covering the ARI curriculum guide for Light Commercial Heating & Air Conditioning.	Air Conditioning and Refrigeration Institute (ARI)	Heating, Ventilation, Air Conditioning, and Refrigeration TDI8503/8504/8505
Linux+ Certification Program Benchmark of basic knowledge and skills pertaining to the Linux computer operating system	Pass one examination consisting of approximately 95 multiple-choice questions, which tests basic knowledge of the work environment and typical job tasks and problems encountered by an entry-level Linux professional.	CompTIA	Choose one of the following: • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651

Title/Description	How To Earn It	Provider	Preparatory Courses
Lodging Management Program Certification, Level 1 Certification indicating that student has studied and experienced career opportunities in the lodging and foodservice industry, has developed skills needed in the operation of a lodging property, and has passed the Level 1 exam	Pass an exam after completing Level 1 of the AH&LA Lodging Management Program. Exam items include overview of lodging management, the front office, and housekeeping.	American Hotel and Lodging Association (AH&LA)	Choose one of the following: • Hotel/Motel Marketing MKT8160/8161 • Hospitality Services II FCS8202
Lodging Management Program Certification, Level 2 Certification indicating that student has studied and experienced career opportunities in the lodging and foodservice industry, has developed skills needed in the operation of a lodging property, and has passed the Level 2 exam	Pass an exam after completing Level 2 of the AH&LA Lodging Management Program. Exam items include leadership and management, marketing and sales, food and beverage service.	American Hotel and Lodging Association (AH&LA)	Choose one of the following: • Advanced Hotel/Motel Marketing MKT8162/8163 • Hospitality Services II FCS8203
Machining Skills—Level 1 Certification of essential knowledge and skills for entry-level machinists in any one of seven distinct Machining Level 1 skill areas	Each of seven credentials that can be earned requires successfully completion of a performance require-ment and a related theory exam. Each credential involves a different written exam with the exception of Turning; the Turning exam needs to be taken only once for both Turning credentials. In summary, there are seven performance requirements and six written exams at Machining Level I.	National Institute for Metalworking Skills, Inc. (NIMS)	Precision Machining Technology TDI8539/8540/8541
Macromedia Certified Professional Certification of knowledge and skill in a specific Macromedia software product. Macromedia-certified developers and designers are considered the elite of Web developers. This certification program is generally considered an advanced level industry certification. Individual assessments are available in the following areas: Certified Macromedia Flash Designer, Certified ColdFusion Developer, Certified Macromedia Flash Developer, Certified Dreamweaver Developer.	Pass an exam that demonstrates proficiency in one of the following Macromedia software products: Dreamweaver MX Certification exam (65 multiple-choice questions/70-minute closed book), Certified Macromedia Flash MX Designer (67 multiple-choice questions/70-minute closed book), Certified Macromedia Flash MX Developer (65 multiple-choice questions/70-minute closed book), and Certified ColdFusion Developer (65 multiple-choice questions/70-minute closed book).	Macromedia	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Graphic Imaging Technology TDI8660/8661/8662
Masonry, Level 1 Certification Certification of knowledge and skills defined as Level 1 competency in the masonry trade area. The certification exam is based upon the NCCER *Contren Learning Series* standardized curriculum.	Pass an exam that covers the following: introduction to masonry, safety requirements, tools and equip-ment; mathematics, drawings and specifications; mortar, masonry units, and installation techniques.	National Center for Construction Education & Research (NCCER)	Choose one of the following: • Building Trades TDI8515/8516/8517 • Masonry TDI 8512/8513/8514

Title/Description	How To Earn It	Provider	Preparatory Courses
Master CIW Administrator* Certification for Web professionals who manage, develop security for, and tune corporate Internet and intranet infrastructure; monitor Web, FTP, news and mail servers; and configure and deploy e-business solutions servers	Pass a series of three knowledge-based exams (based on specific course material) to complete the Master CIW Administrator Certification Track. • Server Administrator • Internetworking Professional • Security Professional	ProsoftTraining	Instructional competencies and materials obtained from specific vendors may be used to prepare students for this certification. The course should be reported as Advanced Information Technology I BUS6680 or Advanced Information Technology II BUS6681.
Master CIW Designer* Certification for Web professionals who implement and maintain hypertext-based Web sites using authoring and scripting languages, create Web content, use Web management and digital media tools, and apply human-factor principles to design	Pass a series of two knowledge-based exams to complete the Master CIW Designer Certification Track: • Site Designer • E-Commerce Designer	ProsoftTraining	Instructional competencies and materials obtained from specific vendors may be used to prepare students for this certification. The course should be reported as Advanced Information Technology I BUS6680 or Advanced Information Technology II BUS6681.
Master CIW Enterprise Developer* A certification series that denotes high-level skills in the design, development, and administration of enterprise-level Web sites with sophisticated database connectivity	Pass a series of six knowledge-based exams to complete the Master CIW Enterprise Developer Track: • Web Languages • Application Developer • Java Programming • Object-Oriented Analysis & Design • Database Specialist • Enterprise Specialist	ProsoftTraining	Instructional competencies and materials obtained from specific vendors may be used to prepare students for this certification. The course should be reported as Advanced Information Technology I BUS6680 or Advanced Information Technology II BUS6681.
Master CIW Web Site Manager* A certification for Web professionals who will develop and manage Web sites and services for small- to medium-sized businesses that do not typically employ large IT staffs	Pass a series of three knowledge-based exams to complete the Master CIW Web Site Manager Certification Track: • Server Administrator • Web Languages • Site Designer	ProsoftTraining	Instructional competencies and materials obtained from specific vendors may be used to prepare students for this certification. The course should be reported as Advanced Information Technology I BUS6680 or Advanced Information Technology II BUS6681.
Medical Assisting Assessment Occupational competency assessment of skills and knowledge covered in a medical assisting instructional program.	Pass the NOCTI knowledge-based exam (3055) consisting of 198 test items. Test includes general office procedures, general laboratory procedures and diagnostics, clinical procedures, patient instruction and foundations of healthcare.	National Occupational Competency Testing Institute (NOCTI)	Medical Assistant II HMS8346
Metalforming Skills—Level 1 Certification of essential knowledge and skills for entry-level sheet metal technician	Metalforming Skills--Level I deals with basic knowledge and skills essential to metal stamping operations and includes part inspection, an intro-duction to SPC, engineering or blueprint reading, safety issues, material handling, maintenance, hazardous waste handling, and others. One credential can be earned at this level.	National Institute for Metalworking Skills, Inc. (NIMS)	Sheet Metal TDI8663/8664/8665

Title/Description	How To Earn It	Provider	Preparatory Courses
Microsoft Certified Applications Developer (MCAD)** Credential for professionals who develop and maintain department-level applications, components, Web or desktop clients, or back office services.	Pass two core exams: • One exam must focus on either Application Development or Windows Application Development in an area of choice. • Other exam focuses on core Web services and server components. Also, pass one elective exam.	Microsoft	Instructional competencies and materials obtained from specific vendors may be used to prepare students for this certification. The course should be reported as Advanced Information Technology I BUS6680 or Advanced Information Technology II BUS6681.
Microsoft Certified Professional (any Microsoft Professional Certification exam)* A measure of technical proficiency and expertise indicated by passing one of Microsoft's industry certification exams, leading toward a more advanced Microsoft certification specialty program.	Pass one current Microsoft certification exam that provides a valid and reliable measure of technical proficiency and expertise (a current exam is any that has not been retired).	Microsoft	Choose one of the following: • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651 • Programming BUS6640 • Advanced Programming BUS6641
Microsoft Certified Professional (MCP): Installing, Configuring, and Administering Microsoft Windows 2000 Professional* Test of the knowledge needed to install, support, and troubleshoot Windows 2000 Professional as a desktop operating system in any network environment. Upon passing, the candidate is considered a Microsoft Certified Professional (MCP). This is the first step toward more advanced career certifications.	Pass one exam, Installing, Configuring, and Administering Microsoft Windows 2000 Professional (70-210).	Microsoft	Choose one of the following: • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651
Microsoft Certified Professional (MCP): Installing, Configuring, and Administering Microsoft Windows 2000 Server* Test of the knowledge needed to support and troubleshoot Windows 2000 Server. Upon passing, the candidate is considered a Microsoft Certified Professional (MCP). This is the first step toward more advanced career certifications.	Pass the Installing, Configuring, and Administering Microsoft Windows 2000 Server exam (70-215).	Microsoft	Choose one of the following: • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651
Microsoft Certified Professional: Visual Basic 6.0 Certification Component (MCSD)* Measure of knowledge of programming using Visual Basic 6.0. Upon passing, a candidate is considered a Microsoft Certified Professional (MCP). This is the first step toward more advanced career certifications.	Pass the Designing and Implementing Desktop Applications with Microsoft® Visual Basic 6.0 exam (70-176).	Microsoft	Choose one of the following: • Programming BUS6640 • Advanced Programming BUS6641

Title/Description	How To Earn It	Provider	Preparatory Courses
Microsoft Certified Professional: Visual C++ 6.0 Certification Component (MCSD)* Measure of knowledge of programming using Visual C++ 6.0. Upon passing, a candidate is considered a Microsoft Certified Professional (MCP). This is the first step toward more advanced career certifications.	Pass the Designing and Implementing Desktop Applications with Microsoft Visual C++ 6.0 exam (70-016).	Microsoft	Choose one of the following: • Programming BUS6640 • Advanced Programming BUS6641
Microsoft Certified Systems Administrator (MCSA)*** Credential related to skills required to implement, manage, and troubleshoot the ongoing needs of Microsoft Windows 2000--based operating environments, including Windows .Net Server.	Pass three core exams and one elective exam. • Core exams include topics such as Installing, Configuring and Administering Microsoft Windows 2000 Professional (or Windows XP Professional)—Desktop, Server, and Network environment. • ComTIA's A+ and Network+ **or** A+ and Server+ may be substituted for the required MCSA elective exam.	Microsoft	Instructional competencies and materials obtained from specific vendors may be used to prepare students for this certification. The course should be reported as Advanced Information Technology I BUS6680 or Advanced Information Technology II BUS6681.
Microsoft Certified Systems Engineer (MCSE)*** Certification of knowledge and skills for information technology professionals who plan, implement, and/or support business solutions using Microsoft Windows Operating Systems and BackOffice applications software.	MCSE candidates on the Microsoft Windows 2000 Track are required to pass five core exams and two elective exams.	Microsoft	Instructional competencies and materials obtained from specific vendors may be used to prepare students for this certification. The course should be reported as Advanced Information Technology I BUS6680 or Advanced Information Technology II BUS6681.

Title/Description	How To Earn It	Provider	Preparatory Courses
Microsoft Office Specialist (MOS)* A globally recognized standard for demonstrating desktop skills with the Microsoft Office suite of business productivity applications. Office Suites include the Office XP, 2000, and 97 versions. Certifications are available at three levels: core, expert, and master.	Two unique Microsoft Office Specialist exams at or above the "core" level must be passed to qualify for student-selected verified credit.	Microsoft	Choose one of the following: • Computer Applications BUS6611 • Computer Information Systems BUS6612 • Advanced Computer Information Systems BUS6613 • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651 • Database Design and Management BUS6660 • Advanced Database Design and Management BUS6661 • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631 • Digital Input Technologies BUS6161 • Information Technology Fundamentals BUS6670 • International Baccalaureate Information Technology in a Global Society IB6613 • Keyboarding Applications BUS6152 • Legal Systems Administration BUS6735 • Medical Systems Administration BUS6730 • Office Administration BUS66216622 • Office Specialist BUS6640/6641/6642 • Word Processing BUS6625
Nail Technician Virginia state license to practice nail care	• Complete the training required by the licensing board as defined in the Code of Virginia. • Pass the written and performance elements of a Virginia licensing examination.	Virginia Board of Cosmetology (Department of Professional & Occupational Regulations)	Nail Technician TDI8692/8693

Title/Description	How To Earn It	Provider	Preparatory Courses
National Professional Certification in Customer Service Certification that documents knowledge and skills in the industry-identified area of Customer Service Skill Standards.	Pass an Internet-delivered, knowledge-based exam made up of real-life customer service situations, some presented through video and audio, with questions presenting possible courses of action.	Sales & Service Voluntary Partnership (S&SVP)	Choose one of the following: • Marketing MKT8120/8121 • Advanced Marketing MKT8130/8131
Network+ Certification* Certification that candidates have knowledge of the layers of the OSI model, can describe the features and functions of network components and have skills needed to install, configure, and troubleshoot basic networking hardware peripherals and protocols.	Pass a written exam requiring knowledge of networking technology and networking application practices.	CompTIA	Advanced Computer Network Software Operations BUS6651
NRDA Certification (Dental Assisting) One of several certifications in the health sciences field offered by the National Association for Health Professionals.	• Complete a state-approved dental assisting program. • Pass a knowledge-based examination pertaining to common requirements and job functions of a dental assistant.	National Allied Health Registry/ National Association for Health Professionals	Dental Assistant HMS8328/8329
NRDA Certification (Medical Assisting) One of several certifications in the health sciences field offered by the National Association for Health Professionals	• Complete a state-approved medical assisting program. • Pass a knowledge-based examination pertaining to common requirements and job functions of a medical assistant.	National Allied Health Registry/ National Association for Health Professionals	Medical Assistant HMS8345/8346
Nurse Aide Certification for individuals who perform patient care in support of registered professional nurses and other health care personnel	• Complete an approved nurse aide program. • Pass a practical and written test focusing on basic emergency procedures, vital signs, intake and output, bathing and oral hygiene, care of the skin, communication and interpersonal skills, infection control, patients' rights, restorative therapy, and the unique needs and behaviors of the cognitively impaired patient.	Virginia Board of Nursing	Choose one of the following: • Health Assistant II HMS8331/8332 • Nursing Assistant II HMS8360/8362 • Practical Nursing II HMS8357/8358
Oil Heat Certification Technicians responsible for service or maintenance of oil heating systems should be certified in this area. Oil heat requires more consistent regular service than any other heat system. Electrical Certification is prerequisite to the Oil Heat exam.	Pass a written exam focusing on the following: fuel oils, combustion products and byproducts, combustion efficiency, gun-type oil burners, nozzles, fuel oil pumps, oil burner components, ignition system, basic service procedures, and preventative maintenance.	HVAC Excellence	Heating, Ventilation, Air Conditioning, and Refrigeration TDI8503/8504/8505
Oracle Certified Professional* (any Oracle Professional Certification Exam) A measure of technical proficiency and expertise indicated by passing one of the Oracle industry certification exams, leading toward a more advanced Oracle certification specialty program.	Pass one current Oracle professional certification exam that provides a valid and reliable measure of technical proficiency and expertise in Oracle database design, development, operation, and maintenance. (A current exam is any that has not been retired.)	Oracle Corporation	Choose one of the following: • Database Design and Management BUS6660 • Advanced Database Design and Management (Oracle Academy) BUS6661

Title/Description	How To Earn It	Provider	Preparatory Courses
Outdoor Power Equipment Certifications A certification program that includes six tests (each one a certification), ranging from small outdoor power engines to compact diesel engines and generators.	Pass any one of the following tests: 2-stroke engine, 4-stroke engine, electrical, drivelines, compact diesel, or generator to receive one of six Outdoor Power Equipment certifications.	Equipment and Engine Training Council (EETC)	Choose one of the following: • Agricultural Power & Equipment ANR8016 • Small Engine Repair ANR8082 • Small Engine Repair TDI8725/8726/8727
Parts Specialist—Automotive or Medium/Heavy Truck (ASE) Certification of knowledge, skills, and professionalism of parts specialists	ASE tests and issues a certification for each of the following three areas: medium/heavy truck parts specialist, automobile parts specialist, and medium/heavy truck aftermarket parts specialist	National Institute for Automotive Service Excellence	Automotive Service Technology—Certified TDI8506/8507/8508
Plumbing Assessment Occupational competency assessment of skills and knowledge covered in an instructional program in the plumbing trade	Pass the NOCTI knowledge-based exam (2061) consisting of 150 test items. Test includes general practices, drainage, venting, joining pipe, installing fixtures and fittings, water supply lines, inspection/ safety, and plumbing math.	National Occupational Competency Testing Institute (NOCTI)	Plumbing TDI8551/8552/8553
Plumbing, Level 1 Certification Certification of knowledge and skills defined as Level 1 competency in the plumbing trade area. The certification exam is based upon the NCCER *Contren Learning Series* standardized curriculum.	Pass an exam that covers the following: introduction to the plumbing trade; plumbing tools; introduction to plumbing math; introduction to plumbing drawings; plastic pipe and fittings; copper pipe and fittings; cast-iron pipe and fittings; carbon steel pipe and fittings; fixtures and faucets; introduction to drain, waste, and vent (DWV) systems; and introduction to water distribution systems.	National Center for Construction Education & Research (NCCER)	Choose one of the following: • Building Trades TDI8515/8516/8517 • Plumbing TDI8551/8552/8553
Pneumatic Technician Certification of fluid power knowledge related to basic principles, concepts, and terms; load and motion analysis; system design, analysis and troubleshooting; component applications; and control systems and control components. In addition, the specialist also is expected to have knowledge of fluids, fluid conductors, and fluid filtration as well as air compression and preparation. *Fluid power* is the generic term for the use and application of hydraulic, pneumatic, electronic control, or vacuum technology used to help operate equipment.	Pass the Pneumatic Specialist Certification Test, a knowledge-based, 3-hour examination that includes 50 multiple choice questions. The examination includes questions relating to fluid power fundamentals, specialized fluid power topics, relay logic, system integration, and electrical control technology.	Fluid Power Society	Industrial Maintenance Technology TDI8575/8576/8577

Title/Description	How To Earn It	Provider	Preparatory Courses
Practical Nursing Assessment Occupational competency assessment of skills and knowledge covered in an instructional program for practical nursing. This assessment is unrelated to the Licensed Practical Nurse (LPN) licensure program.	Pass the NOCTI knowledge-based exam (2062) consisting of 161 test items. Test includes basic communication and employability skills, legal/ethical responsibilities, human growth and development, anatomy and physiology of the human body, patient care skills for all ages, administering medication, principles of infection control, bio-psycho-social support, supervised management functions.	National Occupational Competency Testing Institute (NOCTI)	Practical Nursing II HMS/8358
PrintED Certification (All Exams) A certification program that validates competencies related to PrintED, the industry's national accreditation program for secondary and postsecondary graphic communications programs. The program includes three exams, with a certificate being awarded for each area.	• Complete an instructional program that has achieved the national PrintED accreditation. • Pass one exam (either Introduction to Graphic Communications, Press Operations, or Digital File Preparation) that validates competencies related to the PrintED industry-based curriculum for the graphics communications industry.	Graphic Arts Education and Research Foundation	Graphic Imaging Technology TDI8660/8661/8662
Production Agriculture Assessment Occupational competency assessment of skills and knowledge covered in typical Agricultural Production Technology and/or Management courses.	Pass the NOCTI knowledge-based exam (1063) consisting of 164 test items. Test includes animal science, plant science, agriculture mechanics, farm management, record keeping, leadership, and employability.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Agricultural Production Technology ANR8010 • Agricultural Production Management ANR8012
ProStart National Certification of Achievement (Exit Exam) Certification for individuals who prepare for careers in the restaurant and foodservice industry. Indicates successful completion of an instructional program covering fundamentals of food preparation, introduction to the hospitality industry, customer relations, accounting, cost control, communication, marketing, nutrition, food sanitation, and safety.	• Complete an industry-based ProStart curriculum that includes on-the-job work experience and mentoring in local restaurants. • Pass an end-of-program exam.	Education Foundation of the National Restaurant Association	Choose one of the following: • Culinary Arts FCS8275/8276 • Culinary Arts TDI8521/8522/8523
Real Estate Salesperson Virginia state license to handle purchases and sales of real estate	• Complete the training required by the licensing board as defined in the Code of Virginia. • Pass the written and performance elements of a Virginia licensing examination.	Virginia Real Estate Board (Department of Professional & Occupational Regulations)	Real Estate Marketing MKT8191

Title/Description	How To Earn It	Provider	Preparatory Courses
Residential Air Conditioning and Heating Certification (ARI) Certification offered by ARI and referred to as one its Industry Competency Exams (ICE). It measures industry-agreed standards of basic competency for entry-level (one-year experience or less) technicians in the area of Residential Air Conditioning and Heating (equipment is 5-ton systems or smaller).	Pass an exam that contains 100 multiple-choice questions covering the ARI curriculum guide for Residential Air Conditioning and Heating.	Air Conditioning and Refrigeration Institute	Heating, Ventilation, Air Conditioning, and Refrigeration TDI8503/8504/8505
Retail Trades Assessment Occupational competency assessment of skills, functions, and knowledge foundations related to marketing and merchandising occupations	Pass the NOCTI knowledge-based exam (2053) consisting of 199 test items. Test includes advertising, electronic marketing, visual merchandise, entrepreneurship, economics, communication, selling, employability skills, related mathematics, marketing/merchandising and human relations/customer service.	National Occupational Competency Testing Institute (NOCTI)	Choose one of the following: • Advanced Marketing MKT8130/8131 • Advanced Fashion Marketing MKT8145/8146
SENSE Training Program Certifications (Welding) Certification of knowledge and skills in welding	To earn an AWS SENSE Level I, II, or III certification: • Complete the prescribed SENSE training program offered through an AWS-approved participating organization (program). • Pass the required written and performance-based certification examinations.	American Welding Society	Welding TDI8672/8673/8674
Service Core Certification (HVAC-NATE) First certification required in the service area before a technician chooses a more advanced "specialty service area" exam for an additional certification. A fully certified Service Technician (passing of core exam and specialty area exam) is automatically certified as an Installation Technician without additional testing.	Pass a core service exam that indicates the ability to accomplish the same tasks as an Installation Technician, as well as being able to independently power up and adjust control settings to cycle equipment through all designed-for sequences.	North American Technician Excellence, Inc. (NATE)	Heating, Ventilation, Air Conditioning, and Refrigeration TDI8503/8504/8505
START Certification End-of-course exam that certifies satisfactory completion of the START curriculum related to line level occupations (Guest Service, Rooms Division, Food and Beverage Division) in the hospitality industry. After completing the START curriculum, students may also choose to take other line level certification exams from AH&LA (i.e., Restaurant Server, Room Attendant, Front Desk Agent).	Pass an end-of-course exam that covers specific areas of the hospitality industry. These areas include hospitality orientation, guest services, rooms division, front desk, reservationist, PBX operator, guest room attendant, maintenance worker, laundry attendant, public service cleaner, bell services attendant, and food and beverage division (restaurant server, banquet services, and bus person).	American Hotel and Lodging Association (AH&LA)	Choose one of the following: • Hospitality Services I FCS8202 • Hospitality Services II FCS8203

Title/Description	How To Earn It	Provider	Preparatory Courses
Sun Certified Programmer for Java 2 Platform* Certification for programmers experienced in using the basic syntax and structure of the Java programming language. Certification is available for the Java 2 Platform.	Pass the Sun Certified Programmer for Java 2 Platform exam (310-025).	Sun Microsystems	Choose one of the following: • Advanced Database Design and Management BUS6661 • Advanced Programming BUS6641
UNIX Certificate* End-of-course certificate awarded upon successful completion of the course, Fundamentals of UNIX. It provides a stepping stone to various Sun Systems Administrator certifications and the Linux+ certification from CompTIA.	Pass an end-of-course online exam which includes the following: how to use UNIX operating system commands, basic Sun Microsystems' Solaris operating environment commands, introduction to the Common Desktop Environment (CDE), and fundamental command-line features of the Solaris environment (file system navigation, file permissions, the vi text editor, command shells and basic network use).	Cisco Systems	Choose one of the following: • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651
Voice and Data Cabling Certification End-of-course certificate awarded upon successful completion of the course Fundamentals of Voice and Data Cabling. It provides "stepping stone" preparation to the BICSI Registered Installer, Level I, certification exam.	Pass one end-of-course examination covering the following areas: cabling issues related to data and voice connections; industry and worldwide standards; types of media and cabling; physical and logical networks; signal transmission; documentation, design, and installation issues; and safety issues.	Cisco Systems	Choose one of the following: • Computer Network Software Operations BUS6650 • Advanced Computer Network Software Operations BUS6651 • Electricity and Cabling TDI8533/8534/ 8535
Web Design Certificate* End-of-course certificate awarded upon successful completion of the course Fundamentals of Web Design. It provides a stepping stone to various product certifications in the Adobe Expert program as well as Web design and/or digital media assessments from Brainbench.	Pass an end-of-course online exam that tests the following: Web site production processes; design elements involving layouts, navigation, and interactivity; and Web design exercises using Adobe applications. Web design applications are taught and tested using Adobe Photoshop, Adobe Illustrator, Adobe GoLive, Adobe LiveMotion, and Adobe Premiere.	Cisco Systems	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631
Welding, Level 1 Certification Certification of knowledge and skills defined as Level 1 competency in basic welding. The certification exam will be based upon the NCCER *Contren Learning Series* standardized curriculum.	Pass an exam that focuses on basic welding principles.	National Center for Construction Education & Research (NCCER)	Welding TDI8672/8673/8674

Title/Description	How To Earn It	Provider	Preparatory Courses
WOW Certified Apprentice Webmaster (CAW)* Certification examination that measures essential competencies for aspiring or practicing Webmasters. The intent is to certify individuals in a body of knowledge that is identified and accepted as the baseline or foundation for a Webmaster.	Pass a 70-question exam in 60 minutes that demonstrates knowledge of the following: Internet basics, HTML, Web graphics, Web multimedia, Web site design, Web site management, Web project management, Web marketing, Web accessibility, and basic legal issues.	World Organization of Webmasters	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631
WOW Certified Web Administrator Apprentice (CWAA)* Certification examination that measures fundamental competencies for aspiring or practicing Web administrators. The intent is to certify individuals in a body of knowledge that is identified and accepted as the baseline or foundation of any Web administrator.	Pass a 70-question exam in 60 minutes that demonstrates knowledge of the following: site administration and maintenance, networking basics, hardware and infrastructure, Web business management, and basic security issues.	World Organization of Webmasters	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631
WOW Certified Web Designer Apprentice (CWDSA)* Certification examination that measures essential competencies for aspiring or practicing Web designers. The intent is to certify individuals in a body of knowledge that is identified and accepted as the baseline or foundation of a Web designer.	Pass a 70-question exam in 60 minutes that demonstrates knowledge of Internet basics, HTML and WYSIWYG editors, Web graphics, Web multimedia, Web site design, Web site management, and basic legal issues.	World Organization of Webmasters	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631
WOW Certified Web Developer Apprentice (CWDVA)* Certification examination that measures fundamental competencies for aspiring or practicing Web developers. The intent is to certify individuals in a body of knowledge that is identified and accepted as the baseline or foundation of any Web developer.	Pass a 70-question exam in 60 minutes that demonstrates basic knowledge of programming, markup, scripting, dynamic Web site technologies, servers, networking, Web security, Web business management, legal issues, and Web accessibility.	World Organization of Webmasters	Choose one of the following: • Desktop/Multimedia Presentations BUS6630 • Advanced Desktop/Multimedia Presentations BUS6631

Section 5: Verified Credits

Section 5 gives a brief overview of standard and verified credits, student-selected verified credits, and the requirements for a student-selected verified credit in Career and Technical Education.

Selected National Occupational Competency Test Institute (NOCTI) assessments have been approved by the Virginia Board of Education for student-selected verified credit in approved career and technical education courses or course sequences. You will find a list of the certifications, licenses, occupational competency assessments, and other examinations approved by the Board for student-selected verified credit. To find more information about a particular credential, refer to Section 4.

If you need more information about the Career and Technical Education Seal, see Section 6.

If you need more information about the Advanced Mathematics and Technology Seal, see Section 7.

Section 5: Verified Credits

Standard and Verified Credits

A *standard credit* is based on a minimum of 140 clock hours of instruction and successful completion of the requirements of the course.

A *verified credit* is based on a standard credit plus a passing score on the end-of-course SOL test (or other test as described in the Standards of Accreditation 8 VAC 20-131-110).

Student-Selected Verified Credit

A *student-selected verified credit* can be earned in certain elective courses that include a test approved by the Virginia Board of Education. (According to SOA 8 VAC 20-131-110.B, footnote 5: A student may utilize additional tests for earning verified credit in computer science, technology, or other areas as prescribed by the Board in 8 VAC 20-131-110.B.)

Student-Selected Verified Credit in Career and Technical Education

A student must
- successfully complete a course or course sequence that prepares him or her to earn a Board-approved industry certification or state license, **and**
- successfully complete the assessment required by the certifying or licensing agent.

Certifications, Licenses, and Assessments Approved by the Board of Education to Count toward a Student-Selected Verified Credit
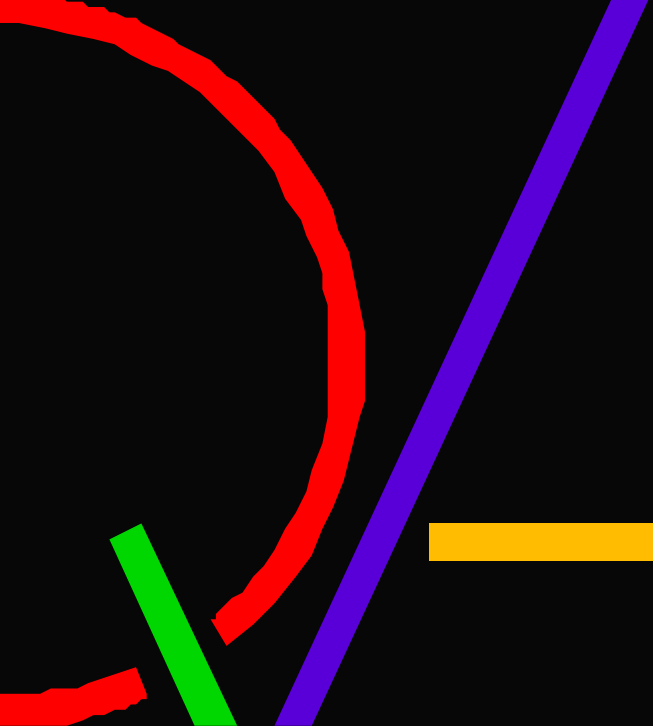
Certification	Issuing Organization
A+ Certification	CompTIA
ACCESS	American Culinary Federation, Inc. (ACF)
Adobe Certified Expert	Adobe Systems Incorporated
Advanced Concepts of Business and Marketing Certificate	ASK Institute ((DECA/MarkED)
Air Conditioning Certification	HVAC Excellence
AutoCAD2000	Brainbench/Autodesk Inc.
Automotive Technician (ASE)	National Institute for Automotive Service Excellence
BICSI Registered Installer, Level 1	BICSI (International Telecommunications Association)
Brainbench Adobe Illustrator Certification	Brainbench
Brainbench Adobe PageMaker Certification	Brainbench
Brainbench Adobe Photoshop Certification	Brainbench
Brainbench Certified Internet Professional: Page Layout Certification	Brainbench
Brainbench CorelDRAW Certification	Brainbench
Brainbench Dreamweaver Certification	Brainbench
Brainbench Fireworks Certification	Brainbench
Brainbench Flash Certification	Brainbench
Brainbench HTML Certification	Brainbench
Brainbench Java Fundamentals Certification	Brainbench
Brainbench Java2 Certification	Brainbench
Brainbench JavaScript Certification	Brainbench
Brainbench Macromedia FreeHand Certification	Brainbench
Brainbench MS FrontPage 2000 Certification	Brainbench
Brainbench Quark Xpress Certification	Brainbench
Carpentry, Level 1 Certification	National Center for Construction Education & Research (NCCER)
Certification for Legal Professionals (ALS)	The Association for Legal Professionals

Certification	Issuing Organization
Certification in Convergent Network Technologies (CCNT)	ProsoftTraining
Certified Computer Service Technician (CST)	Electronics Technicians Association International (ETA)
Certified Dental Assistant: Infection Control Examination ((ICE)	Dental Assisting National Board, Inc.
Certified Dental Assistant: Radiation Health & Safety Examination (RHS)	Dental Assisting National Board, Inc.
Certified Electronics Technician (CET) Associate	Electronics Technicians Association International (ETA)
Certified Fiber Optics Installer	The Association of Communications & Electronics Schools, International
Certified Hospitality Supervisor (CHS)	American Hotel and Lodging Association (AH&LA)
Certified Internet Webmaster Associate Certification	ProsoftTraining
Certified Internet Webmaster Professional	ProsoftTraining
Certified Medical Assistant (CMA)	American Association of Medical Assistants (AAMA)
Certified Novell Administrator (CNA)	Novell
Certified Satellite Dish Installer	Electronics Technicians Association International (ETA)
Child Development Associate (CDA) National Credential	Council for Professional Recognition
Cisco Certified Network Associate (CNA)	Cisco Systems
Collision Repair and Refinishing Technician (ASE)	National Institute for Automotive Service Excellence
Commercial Air Conditioning Certification	HVAC Excellence
Commercial Refrigeration Certification	HVAC Excellence
Construction Fundamentals Certification	National Center for Construction Education & Research (NCCER)
Consumer Electronics Certification (CEC)	Electronics Technicians Association International (ETA)
Copper Based Cabling Certification	RBT Systems, Inc.
Customer Support Specialist Certification	Help Desk Institute
Damage Analysis and Estimating Certification (ASE)	National Institute for Automotive Service Excellence
Drafter Certification	American Design Drafting Association
Electric Heat Certification	HVAC Excellence
Electrical Certification	HVAC Excellence
Electrical, Level 1 Certification	National Center for Construction Education & Research (NCCER)
Emergency Medical Technician	Virginia Department of Health, Office of Emergency Medical Services
EPA Technician Certification ((Core Exams: I, II, or III)	Environmental Protection Agency (Authorized Entity)
Fiber Optic Network Cabling Certification	RBT Systems, Inc.
Fiber Optics Installer Certification (FOIC)	Electronics Technicians Association International (ETA)
Fundamental Concepts of Business and Marketing Certificate	ASK Institute (DECA/MarkED)
Gas Heat Certification	HVAC Excellence
Graymark Cable Installation Certification	Graymark International
Greenhouse Operators Certification Program	Southeast Greenhouse Growers Association
Heat Pump Certification	HVAC Excellence
Hospitality Skills Certification—Front Desk Agents	American Hotel and Lodging Association (AH&LA)
Hospitality Skills Certification—Restaurant Servers	American Hotel and Lodging Association (AH&LA)
Hospitality Skills Certification—Room Attendants	American Hotel and Lodging Association (AH&LA)
HVAC, Level 1 Certification	National Center for Construction Education & Research (NCCER)
Hydraulics Specialist Certification	Fluid Power Society
IC3 Certification	Certiport
International Computer Driving License	ICDL US
iNet+ Certification	CompTIA

Certification	Issuing Organization
Installer Core Certification (HVAC)	North American Technician Excellence, Inc. ((NATE)
IT Essentials Certificate, Level 1	Cisco Systems
IT Essentials Certificate, Level 2	Cisco Systems
Java Programming Certificate	Cisco Systems
Light Commercial Heating & Air Conditioning	Air Conditioning and Refrigeration Institute
Linux+	CompTIA
Lodging Management Program Certification (Levels 1 and/or 2)	American Hotel and Lodging Association (AH&LA)
Machining Skills--Level 1	National Institute for Metalworking Skills (NIMS)
Macromedia Certified Professional	Macromedia
Masonry, Level 1 Certification	National Center for Construction Education & Research (NCCER)
Master CIW Administrator	ProsoftTraining
Master CIW Designer	ProsoftTraining
Master CIW Enterprise Developer	ProsoftTraining
Master CIW Web Site Manager	ProsoftTraining
Metalforming Skills, Level 1	National Institute for Metalworking Skills (NIMS)
Microsoft Certified Applications Developer (MCAD)	Microsoft
Microsoft Certified Professional (MCP) (Any Microsoft Professional Certification Exam)	Microsoft
Microsoft Certified Professional (MCP): Installing, Configuring, and Administering Microsoft Windows 2000 Professional	Microsoft
Microsoft Certified Professional (MCP): Installing, Configuring, and Administering Microsoft Windows 2000 Server	Microsoft
Microsoft Certified Professional (MCP): Visual C++ 6.0	Microsoft
Microsoft Certified Professional (MCP): Visual Basic 6.0	Microsoft
Microsoft Certified Systems Administrator (MCSA)	Microsoft
Microsoft Certified Systems Engineer (MCSE)	Microsoft
Microsoft Office Specialist (MOS)	Microsoft
National Professional Certification in Customer Service	Sales & Service Voluntary Partnership (S&SVP)
Network+ Certification	CompTIA
NRDA Certification (Dental Assisting)	National Allied Health Registry/National Association for Health Professionals
NRDA Certification (Medical Assisting)	National Allied Health Registry/National Association for Health Professionals
Nurse Aide	Virginia Board of Nursing
Oil Heat Certification	HVAC Excellence
Oracle Certified Professional (Any Oracle Professional Certification Exam)	Oracle Corporation
Outdoor Power Equipment Certifications	Equipment and Engine Training Council (EETC)
Parts Specialist: Automobile or Medium/Heavy Truck	National Institute for Automotive Service Excellence
Plumbing, Level 1 Certification	National Center for Construction Education & Research (NCCER)
Pneumatic Technician	Fluid Power Society
PrintED Certification	Graphic Arts Education and Research Foundation
ProStart National Certification of Achievement	Educational Foundation of the National Restaurant Association
Residential Air Conditioning and Heating Certification	Air Conditioning and Refrigeration Institute
SENSE Training Program Certifications (Welding)	American Welding Society (AWS)
Service Core Certification ((HVAC)	North American Technician Excellence, Inc. ((NATE)
START Certification	American Hotel and Lodging Association (AH&LA)

Certification	Issuing Organization
Sun Certified Developer for the Java 2 Platform	Sun Microsystems
Unix Certificate	Cisco Systems
Voice and Data Cabling Certificate	Cisco Systems
Web Design Certificate	Cisco Systems
Welding, Level 1 Certification	National Center for Construction Education & Research (NCCER)
WOW Certified Apprentice Webmaster (CAW)	World Organization of Webmasters
WOW Certified Web Administrator Apprentice (CWAA)	World Organization of Webmasters
WOW Certified Web Designer Apprentice (CWDSA)	World Organization of Webmasters
WOW Certified Web Developer Apprentice (CWDVA)	World Organization of Webmasters
Licensing	**Issuing Organization**
Cosmetology	Virginia Board of Cosmetology (Department of Professional and Occupational Regulations)
Nail Technician	Virginia Board of Cosmetology (Department of Professional and Occupational Regulations)
Real Estate Salesperson	Virginia Real Estate Board (Department of Professional and Occupational Regulations)
Assessments	**Issuing Organization**
Advertising and Design Assessment	National Occupational Competency Testing Institute (NOCTI)
Agriculture Mechanics Assessment	NOCTI
Air Cooled Gas Engine Assessment	NOCTI
Audio-Visual Communications Assessment	NOCTI
Cabinetmaking Assessment	NOCTI
Carpentry Assessment	NOCTI
Clothing and Textiles Management and Production Assessment	NOCTI
Commercial Foods Assessment	NOCTI
Construction Electricity Assessment	NOCTI
Construction Masonry—Blocklaying Assessment	NOCTI
Construction Masonry—Bricklaying Assessment	NOCTI
Dental Assisting Assessment	NOCTI
Early Childhood Care and Education Assessment	NOCTI
Food Production Management and Services Assessment	NOCTI
Forestry Products & Processing Assessment	NOCTI
Graphic Communication Technology Assessment	NOCTI
Horticulture—Floriculture Assessment	NOCTI
Horticulture—Landscaping Assessment	NOCTI
Horticulture—Olericulture Assessment	NOCTI
Hospitality Management—Food and Beverage Option Assessment	NOCTI
Hospitality Management—Lodging Option	NOCTI
Law Enforcement Assessment	NOCTI
Medical Assisting Assessment	NOCTI
Plumbing Assessment	NOCTI
Practical Nursing Assessment	NOCTI
Production Agriculture Assessment	NOCTI
Retail Trades	NOCTI
Examination	**Issuing Organization**
Advanced Placement Computer Science A	The College Board
Advanced Placement Computer Science AB	The College Board
College Level Examination Program (CLEP): Information Systems and Computer Applications	The College Board

Certification	Issuing Organization
International Baccalaureate Computer Science (Standard Level)	The International Baccalaureate Organization
International Baccalaureate Computer Science ((Higher Level)	The International Baccalaureate Organization
International Baccalaureate Information Technology in a Global Society (IB6613) (Standard Level)	The International Baccalaureate Organization

Section 6: Career and Technical Education Seal

Section 6 presents the requirements for obtaining a Career and Technical Education Seal.

You will also find a list of all the certifications and licenses approved by the Virginia Board of Education for the CTE seal. To find more information about a particular certification, license, or assessment, refer to Section 4.

Section 6: Career and Technical Education Seal

Requirements for a Career and Technical Education Seal

The student must

1. Fulfill the requirements for either a standard or advanced studies diploma.

2. Complete a prescribed sequence of courses in a CTE concentration or specialization.

3. Meet one of the following conditions:
   - Maintain a B or better average in CTE courses.
   - Pass an exam that confers certification from a recognized industry, trade, or professional association.
     Example: A+ exam for computer hardware installation and maintenance
   - Acquire a professional license in a career and technical field. *Example:* Virginia Cosmetology License.

Certifications and Licenses That Meet the Board of Education Requirements for a Career and Technical Education Seal

Certification	Issuing Organization
A+ Certification	CompTIA
ACCESS	American Culinary Federation, Inc. (ACF)
Adobe Certified Expert	Adobe Systems Incorporated
Advanced Concepts of Business and Marketing Certificate	ASK Institute ((DECA/MarkED)
Air Conditioning Certification	HVAC Excellence
AutoCAD2000	Brainbench/Autodesk Inc.
Automotive Technician (ASE)	National Institute for Automotive Service Excellence
BICSI Registered Installer, Level 1	BICSI (International Telecommunications Association)
Brainbench Adobe Illustrator Certification	Brainbench
Brainbench Adobe PageMaker Certification	Brainbench
Brainbench Adobe Photoshop Certification	Brainbench
Brainbench Certified Internet Professional: Page Layout Certification	Brainbench
Brainbench CorelDRAW Certification	Brainbench
Brainbench Dreamweaver Certification	Brainbench
Brainbench Fireworks Certification	Brainbench
Brainbench Flash Certification	Brainbench
Brainbench HTML Certification	Brainbench
Brainbench Java Fundamentals Certification	Brainbench
Brainbench Java2 Certification	Brainbench
Brainbench JavaScript Certification	Brainbench
Brainbench Macromedia FreeHand Certification	Brainbench
Brainbench MS FrontPage 2000 Certification	Brainbench
Brainbench Quark Xpress Certification	Brainbench
Carpentry, Level 1 Certification	National Center for Construction Education & Research (NCCER)
Certification for Legal Professionals (ALS)	The Association for Legal Professionals
Certification in Convergent Network Technologies (CCNT)	ProsoftTraining
Certified Computer Service Technician (CST)	Electronics Technicians Association International (ETA)
Certified Dental Assistant: Infection Control Examination ((ICE)	Dental Assisting National Board, Inc.
Certified Dental Assistant: Radiation Health & Safety Examination (RHS)	Dental Assisting National Board, Inc.
Certified Electronics Technician (CET) Associate	Electronics Technicians Association International (ETA)

Certification	Issuing Organization
Certified Fiber Optics Installer	The Association of Communications & Electronics Schools, International
Certified Hospitality Supervisor (CHS)	American Hotel and Lodging Association (AH&LA)
Certified Internet Webmaster Associate Certification	ProsoftTraining
Certified Internet Webmaster Professional	ProsoftTraining
Certified Medical Assistant (CMA)	American Association of Medical Assistants (AAMA)
Certified Novell Administrator (CNA)	Novell
Certified Satellite Dish Installer	Electronics Technicians Association International (ETA)
Child Development Associate (CDA) National Credential	Council for Professional Recognition
Cisco Certified Network Associate (CNA)	Cisco Systems
Collision Repair and Refinishing Technician (ASE)	National Institute for Automotive Service Excellence
Commercial Air Conditioning Certification	HVAC Excellence
Commercial Refrigeration Certification	HVAC Excellence
Construction Fundamentals Certification	National Center for Construction Education & Research (NCCER)
Consumer Electronics Certification (CEC)	Electronics Technicians Association International (ETA)
Copper Based Cabling Certification	RBT Systems, Inc.
Customer Support Specialist Certification	Help Desk Institute
Damage Analysis and Estimating Certification (ASE)	National Institute for Automotive Service Excellence
Drafter Certification	American Design Drafting Association
Electric Heat Certification	HVAC Excellence
Electrical Certification	HVAC Excellence
Electrical, Level 1 Certification	National Center for Construction Education & Research (NCCER)
Emergency Medical Technician	Virginia Department of Health, Office of Emergency Medical Services
EPA Technician Certification ((Core Exams: I, II, or III)	Environmental Protection Agency (Authorized Entity)
Fiber Optic Network Cabling Certification	RBT Systems, Inc.
Fiber Optics Installer Certification (FOIC)	Electronics Technicians Association International (ETA)
Fundamental Concepts of Business and Marketing Certificate	ASK Institute (DECA/MarkED)
Gas Heat Certification	HVAC Excellence
Graymark Cable Installation Certification	Graymark International
Greenhouse Operators Certification Program	Southeast Greenhouse Growers Association
Heat Pump Certification	HVAC Excellence
Hospitality Skills Certification—Front Desk Agents	American Hotel and Lodging Association (AH&LA)
Hospitality Skills Certification—Restaurant Servers	American Hotel and Lodging Association (AH&LA)
Hospitality Skills Certification—Room Attendants	American Hotel and Lodging Association (AH&LA)
HVAC, Level 1 Certification	National Center for Construction Education & Research (NCCER)
Hydraulics Specialist Certification	Fluid Power Society
IC3 Certification	Certiport
International Computer Driving License	ICDL US
iNet+ Certification	CompTIA
Installer Core Certification (HVAC)	North American Technician Excellence, Inc. ((NATE)
IT Essentials Certificate, Level 1	Cisco Systems
IT Essentials Certificate, Level 2	Cisco Systems
Java Programming Certificate	Cisco Systems
Light Commercial Heating & Air Conditioning	Air Conditioning and Refrigeration Institute
Linux+	CompTIA
Lodging Management Program Certification (Levels 1 and/or 2)	American Hotel and Lodging Association (AH&LA)

Certification	Issuing Organization
Machining Skills--Level 1	National Institute for Metalworking Skills (NIMS)
Macromedia Certified Professional	Macromedia
Masonry, Level 1 Certification	National Center for Construction Education & Research (NCCER)
Master CIW Administrator	ProsoftTraining
Master CIW Designer	ProsoftTraining
Master CIW Enterprise Developer	ProsoftTraining
Master CIW Web Site Manager	ProsoftTraining
Metalforming Skills, Level 1	National Institute for Metalworking Skills (NIMS)
Microsoft Certified Applications Developer (MCAD)	Microsoft
Microsoft Certified Professional (MCP) (Any Microsoft Professional Certification Exam)	Microsoft
Microsoft Certified Professional (MCP): Installing, Configuring, and Administering Microsoft Windows 2000 Professional	Microsoft
Microsoft Certified Professional (MCP): Installing, Configuring, and Administering Microsoft Windows 2000 Server	Microsoft
Microsoft Certified Professional (MCP): Visual C++ 6.0	Microsoft
Microsoft Certified Professional (MCP): Visual Basic 6.0	Microsoft
Microsoft Certified Systems Administrator (MCSA)	Microsoft
Microsoft Certified Systems Engineer (MCSE)	Microsoft
Microsoft Office Specialist (MOS)	Microsoft
National Professional Certification in Customer Service	Sales & Service Voluntary Partnership (S&SVP)
Network+ Certification	CompTIA
NRDA Certification (Dental Assisting)	National Allied Health Registry/National Association for Health Professionals
NRDA Certification (Medical Assisting)	National Allied Health Registry/National Association for Health Professionals
Nurse Aide	Virginia Board of Nursing
Oil Heat Certification	HVAC Excellence
Oracle Certified Professional (Any Oracle Professional Certification Exam)	Oracle Corporation
Outdoor Power Equipment Certifications	Equipment and Engine Training Council (EETC)
Parts Specialist: Automobile or Medium/Heavy Truck	National Institute for Automotive Service Excellence
Plumbing, Level 1 Certification	National Center for Construction Education & Research (NCCER)
Pneumatic Technician	Fluid Power Society
PrintED Certification	Graphic Arts Education and Research Foundation
ProStart National Certification of Achievement	Educational Foundation of the National Restaurant Association
Residential Air Conditioning and Heating Certification	Air Conditioning and Refrigeration Institute
SENSE Training Program Certifications (Welding)	American Welding Society (AWS)
Service Core Certification ((HVAC)	North American Technician Excellence, Inc. ((NATE)
START Certification	American Hotel and Lodging Association (AH&LA)
Sun Certified Developer for the Java 2 Platform	Sun Microsystems
Unix Certificate	Cisco Systems
Voice and Data Cabling Certificate	Cisco Systems
Web Design Certificate	Cisco Systems
Welding, Level 1 Certification	National Center for Construction Education & Research (NCCER)
WOW Certified Apprentice Webmaster (CAW)	World Organization of Webmasters
WOW Certified Web Administrator Apprentice	World Organization of Webmasters

Certification	Issuing Organization
(CWAA)	
WOW Certified Web Designer Apprentice (CWDSA)	World Organization of Webmasters
WOW Certified Web Developer Apprentice (CWDVA)	World Organization of Webmastersv
Licensing	**Issuing Organization**
Cosmetology	Virginia Board of Cosmetology (Department of Professional and Occupational Regulations)
Nail Technician	Virginia Board of Cosmetology (Department of Professional and Occupational Regulations)
Real Estate Salesperson	Virginia Real Estate Board (Department of Professional and Occupational Regulations)
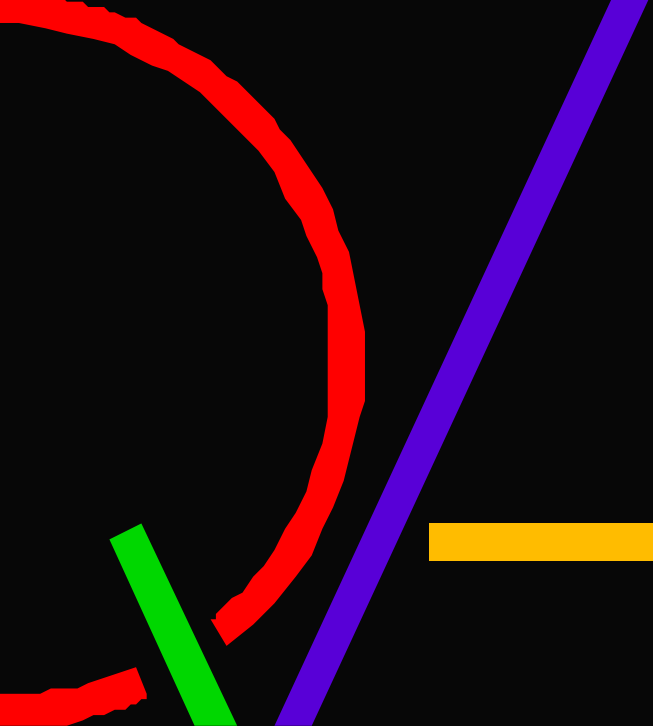
Section 7: Advanced Mathematics and Technology Seal

Section 7 presents the requirements for obtaining an Advanced Mathematics and Technology seal.

You will also find a list of all the certifications and examinations approved by the Virginia Board of Education for this seal. To find more information about a particular certification, refer to Section 4.

Section 7: Advanced Mathematics and Technology Seal

Requirements for an Advanced Mathematics and Technology Seal
1. Fulfill the requirements for either a standard or advanced studies diploma.

2. Satisfy all mathematics requirements for the Advanced Studies Diploma (four units of credit including Algebra II) with two verified units of credit with a B average or better.

3. Meet one of the following conditions:
   - Pass an exam that confers certification from a recognized industry, trade, or professional association
     Example: Microsoft Certified Systems Administrator
   - Pass an exam approved by the Board that confers college-level credit in a technology or computer science area.
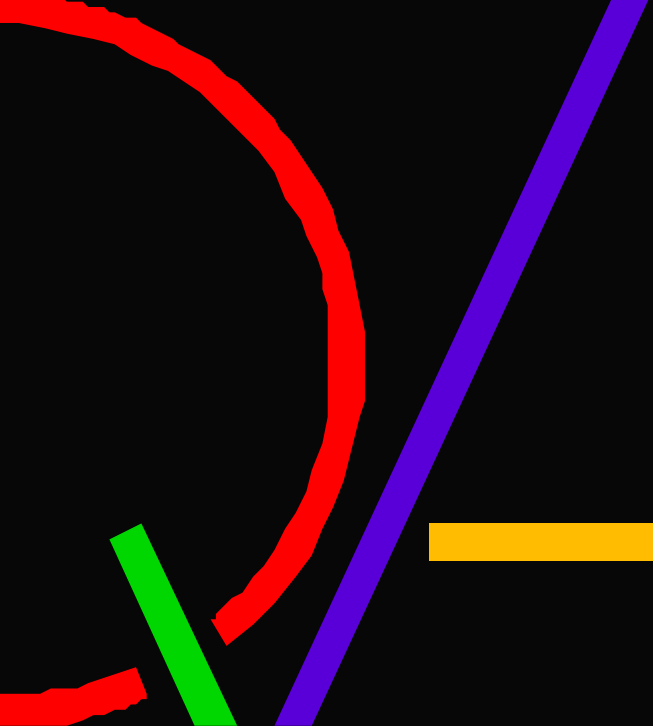
Technology or Computer Science Courses for College-Level Credit Approved by the Board Education for the Advanced Mathematics and Technology Seal
   - Advanced Placement Computer Science A (Passing Score: 3)
   - Advanced Placement Computer Science AB (Passing Score: 3)
   - College Level Examination (CLEP) Information Systems and Computer Applications (Passing Score: 52)
   - International Baccalaureate Computer Science (Standard Level) (Passing Score: 3)
   - International Baccalaureate Computer Science (Higher Level) (Passing Score: 3)
   - International Baccalaureate Information Technology in a Global Society (Standard Level) (Passing Score: 3)

Certifications That Meet the Board of Education Requirements for
Advanced Mathematics and Technology Seal

Certification	Issuing Organization
A+ Certification	CompTIA
Adobe Certified Expert	Adobe Systems Incorporated
Brainbench Adobe Illustrator Certification	Brainbench
Brainbench Adobe PageMaker Certification	Brainbench
Brainbench Adobe Photoshop Certification	Brainbench
Brainbench Certified Internet Professional: Page Layout Certification	Brainbench
Brainbench CorelDRAW Certification	Brainbench
Brainbench Dreamweaver Certification	Brainbench
Brainbench Fireworks Certification	Brainbench
Brainbench Flash Certification	Brainbench
Brainbench HTML Certification	Brainbench
Brainbench Java Fundamentals Certification	Brainbench
Brainbench Java2 Certification	Brainbench
Brainbench JavaScript Certification	Brainbench
Brainbench Macromedia FreeHand Certification	Brainbench
Brainbench MS FrontPage 2000 Certification	Brainbench
Brainbench Quark Xpress Certification	Brainbench
Certification in Convergent Network Technologies (CCNT)	ProsoftTraining
Certified Computer Service Technician (CST)	Electronics Technicians Association International (ETA)
Certification in Convergent Network Technologies (CCNT)	ProsoftTraining
Certified Computer Service Technician (CST)	Electronics Technicians Association International (ETA)
Certified Internet Webmaster Associate Certification	ProsoftTraining
Certified Internet Webmaster Professional	ProsoftTraining

Certification	Issuing Organization
Certified Novell Administrator (CNA)	Novell
Cisco Certified Network Associate (CNA)	Cisco Systems
IC3 Certification	Certiport
International Computer Driving License	ICDL US
iNet+ Certification	CompTIA
IT Essentials Certificate, Level 1	Cisco Systems
IT Essentials Certificate, Level 2	Cisco Systems
Java Programming Certificate	Cisco Systems
Linux+	CompTIA
Macromedia Certified Professional	Macromedia
Master CIW Administrator	ProsoftTraining
Master CIW Designer	ProsoftTraining
Master CIW Enterprise Developer	ProsoftTraining
Master CIW Web Site Manager	ProsoftTraining
Microsoft Certified Applications Developer (MCAD)	Microsoft
Microsoft Certified Professional (MCP) (Any Microsoft Professional Certification Exam)	Microsoft
Microsoft Certified Professional (MCP): Installing, Configuring, and Administering Microsoft Windows 2000 Professional	Microsoft
Microsoft Certified Professional (MCP): Installing, Configuring, and Administering Microsoft Windows 2000 Server	Microsoft
Microsoft Certified Professional (MCP): Visual C++ 6.0	Microsoft
Microsoft Certified Professional (MCP): Visual Basic 6.0	Microsoft
Microsoft Certified Systems Administrator (MCSA)	Microsoft
Microsoft Certified Systems Engineer (MCSE)	Microsoft
Network+ Certification	CompTIA
Oracle Certified Professional (Any Oracle Professional Certification Exam)	Oracle Corporation
Web Design Certificate	Cisco Systems
WOW Certified Apprentice Webmaster (CAW)	World Organization of Webmasters
WOW Certified Web Administrator Apprentice (CWAA)	World Organization of Webmasters
WOW Certified Web Designer Apprentice (CWDSA)	World Organization of Webmasters
WOW Certified Web Developer Apprentice (CWDVA)	World Organization of Webmasters
Examination	**Issuing Organization**
Advanced Placement Computer Science A	The College Board
Advanced Placement Computer Science AB	The College Board
College Level Examination Program (CLEP): Information Systems and Computer Applications	The College Board
International Baccalaureate Computer Science (Standard Level)	The International Baccalaureate Organization
International Baccalaureate Computer Science ((Higher Level)	The International Baccalaureate Organization
International Baccalaureate Information Technology in a Global Society (IB6613) (Standard Level)	The International Baccalaureate Organization

Section 8: Career Planning

Section 8 includes brief look at career clusters, a nationally accepted method of exploring careers. A new Web site for the *CTE Career Planning Guide* is planned for the fall of 2003. This Web site will help students find connections between careers of interest and CTE course sequences.

If you are interested in middle school courses,many of which include career exploration, see Section 9.

If you are interested in career awareness at the elementary school level, see Section 10.

Section 8: Career Planning

To help students investigate careers and design their courses of study to advance their career goals, the Office of Career and Technical Education in Virginia has adopted the nationally accepted structure of career clusters, career pathways, and sample career specialties or occupations. Detailed information about the States' Career Clusters Initiative appears at http://www.careerclusters.org.

Career Clusters and Common Core of Knowledge and Skills
Each of the 16 career clusters has a common core of knowledge and skills required for career success in all the occupations included in the cluster. This core of knowledge and skills consists of the following areas, which may require different applications in different clusters. (For example, the academic foundations and technical skills needed by architects differ from those needed by health care professionals.)

- Academic foundations
- Communication
- Problem solving and critical thinking
- Information technology
- Systems

- Safety, health, and environment
- Leadership and teamwork
- Ethics and legal responsibilities
- Employability and career development
- Technical skills

Identification of Career Clusters
The 16 career clusters are as follows:

- Agriculture, Food, and Natural Resources
- Architecture and Construction
- Arts, A/V Technology, and Communications
- Business, Management, and Administration
- Education and Training
- Finance
- Government and Public Administration
- Health Science
- Hospitality and Tourism

- Human Services
- Information Technology
- Law, Public Safety, and Security
- Manufacturing
- Marketing, Sales, and Service
- Science, Technology, Engineering, and Mathematics
- Transportation, Distribution, and Logistics

Connection of Career Pathways and Occupations to CTE Courses
Each career pathway within a cluster offers many occupational specialties. Students may choose CTE and academic courses that will help them explore or prepare for a group of careers (a cluster), a pathway (group of careers within a cluster), or an occupational specialty (single career).

The charts that follow show two sample clusters and their associated pathways, sample occupational specialties for one pathway, and a sample sequence of applicable courses. The sequence applies to the pathways and occupations shown in italics.

Cluster	Pathways	Sample Occupational Specialties	Sample CTE Course Sequence
Agriculture, Food, and Natural Resources	Food Products and Processing Systems *Plant Systems* Animal Systems Power, Structural, and Technical Systems Natural Resource Systems Environmental Service Systems Agribusiness Systems	*Plant Breeder/Geneticist* Soil and Water Specialist Certified Crop Adviser *Botanist* Tree Surgeon Education/Extension Specialist Golf Course Superintendent *Greenhouse Manager*	Horticulture Sciences ANR8034 and one of the following: • Greenhouse Plant Production and Management ANR8035 • Landscaping ANR8036 • Floriculture ANR8036 • Floral Design I ANR8055 • Specialty Horticulture Arts ANR8037

Cluster	Pathways	Sample Occupational Specialties	Sample CTE Course Sequence
Human Services	**_Early Childhood Development and Services_** Counseling and Mental Health Services Family and Community Services Personal Care Services Consumer Services	**_Director, Childcare Facility_** **_Childcare Worker_** **_Nanny_** **_Preschool Teacher_** **_Teacher Assistant_** **_Parent Educator_**	Early Childhood Education I FCS8285 **and** a combination of one or more of the following courses equivalent to **a** total of two 36-week courses: • Early Childhood Education II FCS8286 • Family Relations FCS8223*/FCS8225 • Individual Development FCS8209*/FCS8210 • Parenting FCS8231 • Introduction to Early Childhood Education FCS8234 • GRADS FCS8213 (with cooperative education) *18-week course

Career Planning Guide

The *CTE Career Planning Guide* is being revised to reflect the new national structure of career families. Look for this new Web site in the fall of 2003. Users will be able to connect careers and courses in ways that will enhance career exploration, planning, and preparation.

Other Career Resources

Check out the following resources for career planning by going to the Virginia Career Resource Network at http:www.pen.k12.va.us/VDOE/Instruction/CTE/.

- CareerConnect (Virginia's One Stop Workforce System)
- Guide to Career Prospects in Virginia
- r u ready
- Virginia Career Resource Network
- Virginia Department of Professional and Occupational Regulation
- Virginia Employment Commission
- Mid-Atlantic Guide to Information on Careers (MAGIC)
- Virginia's Electronic Labor Market Access System (VELMA)
- Virginia VIEW Career Information

Section 9: Middle School Courses

Section 9 presents descriptions of all the CTE courses offered in middle school, organized alphabetically. Also, a list of CTE courses that may be taught in middle school for high school credit may help students balance their academic and CTE course options.

Section 9: Middle School Courses

Students in middle school have the opportunity to gain a foundation in technical fields and explore careers through a variety of career and technical courses described below. These experiences will help students make sound choices related to their academic and elective program of studies in high school.

Agriscience Exploration ANR8003
Grade Level: 7 (18 weeks)
Students explore science as it relates to agriculture and develop an understanding of human relations, communication, the importance of agriculture to the economy, and key scientific terms related to the field of agriculture.

Agriscience and Technology ANR8004
Grade Level: 8 (18 or 36 weeks)
Through laboratory activities, students apply scientific principles to the field of agriculture, including plants, animals, and ecology/conservation. The course introduces students to biotechnology as it relates to agriculture.

Career Pathways Phase 1 (Career Exploration) CCN9070
Grade Levels: 6-12 (Time and schedule locally determined)
Phase 1 prepares students to be "career investigators." To obtain the title, students must assess their role in society, identify their role as a worker, analyze their personal assets, complete a basic exploration of career clusters and select career fields or occupations for further study, and secure a career investigator (job shadowing) position with a local employer.

Career Pathways (Career Skills) Phase 2 CCN9071
Grade Levels: 6-12 (Time and schedule locally determined)
Phase 2 consists of an in-depth study of one to four or more career clusters through a variety of investigative activities with local employers. Students observe, analyze, and report on the demand for workers, worker qualifications, organizational structures, quality control measures, selected policies and regulations, ethical issues, and rewards of work. Students who complete Phase 2 successfully qualify to become "career analysts."

Careers and You DTE8475
Grade Level: 5 or 6 (9, 18, or 36 weeks, single period)
Elementary or middle school students may enroll in this course prior to taking career and technical or career exploratory courses. They investigate the 16 career clusters designated by the U.S. Office of Education by focusing on
- understanding oneself in relation to work
- understanding and simulating work styles (mechanical, conventional, enterprising, social, investigative, and creative)
- identifying and simulating selected careers
- planning for future exploratory courses or activities.

Computer Applications BUS6611
Grade Levels: 7, 8, 9, 10 (36 weeks)
Computer Applications BUS6617
Grade Levels: 7, 8, 9, 10 (18weeks)
Prerequisite: Keyboarding* recommended
Students develop or review correct keyboarding techniques and gain a basic knowledge of word processing, spreadsheet, database, graphics, and telecommunications applications. Students demonstrate an understanding of computer concepts through application of knowledge. Students learn to use software packages and local and worldwide network communications systems. Grade 8 Computer/Technology Standards of Learning are incorporated and reinforced in this course.
*Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills

Computer Solutions BUS6609
Grade Levels: 7, 8 (6/9/12/18 weeks)
Computer Solutions BUS6609
Grade Levels: 7, 8 (36 weeks)
Students use the computer as a problem-solving tool to complete a variety of projects. Students participate in team-building activities that include both academic and business competencies. Basic touch keyboarding instruction is provided early in the course.

Digital Input Technologies BUS 6160 (18 weeks)/**BUS6161** (36 weeks)
Grade Levels: 7, 8, or 9
Prerequisite: Keyboarding* is recommended for 18-weeks course.
The Digital Input Technologies course introduces new and emerging tools that are quickly becoming standard in today's workplace. Students develop proficiency using Personal Data Assistants (PDAs), speech recognition software, and input tools for entering and manipulating text and data. The 36-week course offers secondary-level keyboarding skills.
*Keyboarding course(s) or teacher-approved demonstrated and documented touch keyboarding skills

Education for Employment (EFE)
Introduction CCN9075 (for Students Identified as Disadvantaged—18 weeks)
Introduction CCN9076 (for Students Identified as Disadvantaged—other than 18 weeks)
Introduction CCN9082 (for Students with Disabilities—18 weeks)
Introduction CCN9083 (for Students with Disabilities—other than 18 weeks)
Grade Levels: 6, 7, 8, 9
Students explore independent living and workplace skills by identifying individual assets, interests, aptitudes, talents, and current occupational abilities. Through practical experiences related to daily living and work, students determine strategies to improve their assets and ways to emphasize their strengths at home, school, and in the workplace.

Exploring Work and Family Roles
FCS8204 Exploratory Grade 6
FCS8206 Exploratory Grade 7
FCS8208 Exploratory Grade 8
FCS8241 Exploratory 6 weeks
FCS8242 Exploratory 9 weeks
FCS8243 Exploratory 12 weeks
FCS8244 Exploratory 18 weeks
FCS8245 Exploratory 36 weeks
The middle school exploratory courses provide a foundation for management of individual, family, work, and community roles and responsibilities. Students explore concepts and practice skills related to problem solving, leadership, interpersonal relationships, ethical practices, career interests, environmental issues, and high-quality work. Mathematics, science, language, social sciences, fine arts, and technology are integrated throughout the program. Exploring Work and Family Roles is the foundation for Family and Consumer Sciences programs on the high school level.

GRADS FCS8211/FCS8212 (18/36 weeks)
Grade Levels: 6-8
Students enrolled in the **G**raduation, **R**eality, **A**nd **D**ual-role **S**kills Program (GRADS) concentrate on developing self-esteem; using effective communication skills; maintaining positive relationships; promoting wellness, prenatal, and postnatal care; evaluating the cost of parenthood; adjusting to parenthood; understanding child development; providing child care; managing family relationships; exploring careers; applying employability skills; managing economic resources and expenditures; and balancing work and family. Teachers highlight the basic skills of math and science when appropriate in the content.

Health and Medical Sciences Exploratory HMS8370
Grade Level: Middle School (18 weeks, single period)
This course follows a complementary course such as Careers and You. Students explore families of health careers and related occupations, participate in self-awareness activities, and receive an overview of the national health industry. Course content may also include the criteria for entering certain biomedical scientific careers and activities dealing with communication, problem solving, and critical thinking.

Introduction to Agriscience ANR8002
Grade Level: 6 (18 weeks or less)
Middle school students develop an awareness of the relationships between agriculture and science. Major concepts covered in the course include awareness of agriculture, the world of work, agribusiness careers, human relations, and scientific principles applied in agriculture.

Introduction to Technology DTE8483 (36 weeks)
Introduction to Technology DTE8482 (18 weeks)
Introduction to Technology DTE8484 (12 weeks)
Introduction to Technology DTE8481 (9 weeks)
Grade Level: 6
Students first study the basic elements of all technology, including processes, energy, information, and people. They explore up to four systems of technology, including construction, transportation, communication, and production/manufacturing. Finally, they relate the impact of technology on society, environment, and culture to future consequences and decisions.

Inventions and Innovations DTE8461 (36 weeks)
Inventions and Innovations DTE8464 (18 weeks)
Inventions and Innovations DTE8485 (12 weeks)
Grade Level: 7
Students make models of significant inventions that have advanced society. After studying these developments, they explore contemporary technological problems facing them, their community, or the world and apply systematic procedures to invent new products or innovations as solutions.

Make It Your Business BUS6110
Grade Levels: 6, 7, 8, 9 (6/9/12 weeks)
Make It Your Business BUS6111
Grade Levels: 6, 7, 8, 9 (18 weeks)
Students are provided opportunities to run a small group or class business based on their own design for providing a service or product needed at their school. Students learn business terminology, basic entrepreneurship concepts, and fundamental business operating principles in this course. Design of course content provides for interdisciplinary instruction.

Make It Your Business MKT8109
Grade Levels: 6, 7, 8, 9 (6 weeks)
Make It Your Business MKT8112
Grade Levels: 6, 7, 8, 9 (9 weeks)
Make It Your Business MKT8113
Grade Levels: 6, 7, 8, 9 (12 weeks)
Make It Your Business MKT8114
Grade Levels: 6, 7, 8, 9 (18 weeks)
Students are provided opportunities to run a small group or class business based on their own design for providing a service or product needed at their school. They learn business terminology, basic entrepreneurship concepts, and fundamental business operating principles in this course. Design of course content allows for interdisciplinary instruction. Academic knowledge and skills (mathematics, science, English, and history/social science) related to the content are a part of this course. Computer/technology applications supporting this course are studied.

ProTeam CCN9060/CCN9061
Grade Level: 7 or 8
ProTeam is an exploratory class for students in grades 7 and 8 with a career interest in teaching and education. The curriculum is designed to help students set realistic goals that include the steps to prepare for successful completion of high school and college, including an emphasis on career development competencies. The eight course modules are *I Can Self-Reflect, I Can Communicate, I Can Teach Others, I Can Be Different, I Can Make Decisions, I Can Set Goals,* and *I Can Think Positively.* The course has an emphasis on service learning, cooperative work groups, teaching-like experiences, and family involvement. This program shall be articulated with a Teacher Cadet program at the high school.

Technological Systems DTE8462 (36 weeks)
Technological Systems DTE8463 (18 weeks)
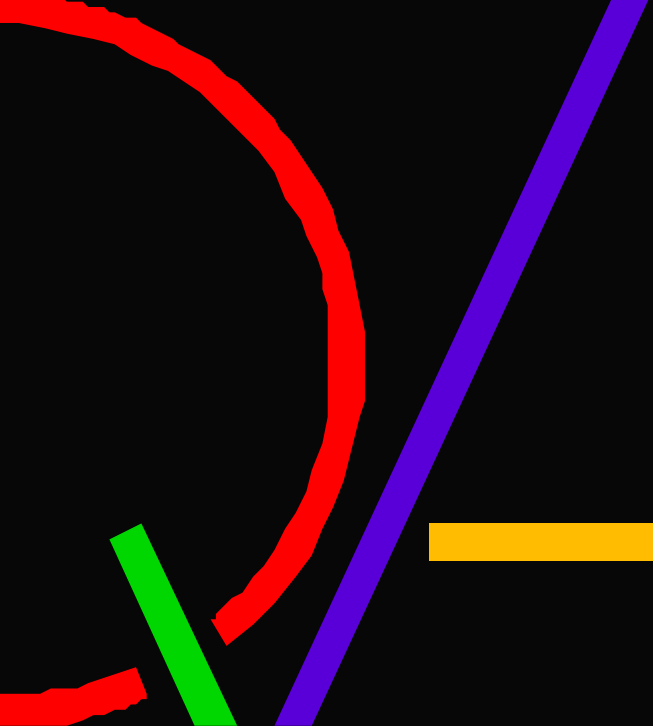**Technological Systems DTE8486** (12 weeks)
Grade Level: 8
Students combine resources and techniques into systems, realizing technology as a system. By simulating systems, assessing their impacts, and relating this experience to the two previous levels, students gain an insight into how to approach the problems and opportunities of a technological world in a broad sense. They also explore occupational areas and educational programs for technology-oriented careers.

HIGH SCHOOL CREDIT FOR CTE COURSES OFFERED IN MIDDLE SCHOOL

In addition to exploratory courses, school divisions may offer some career and technical courses to middle school students for high school credit. The courses must be the same length and taught with the same content as the courses taught at the high school level. Students should see the school counselor for a complete explanation of course offerings for credit.

These courses are described in Section 2.

- Basic Agricultural Mechanics and Plant Science ANR8006
- Basic Agricultural Mechanics and Animal Science ANR8008
- Career Pathways CCN9070/CCN9071
- Computer Applications BUS6611
- Principles of Business and Marketing BUS6115
- Principles of Business and Marketing MKT8115
- Keyboarding BUS6151/BUS6152/BUS6153
- Information Technology Fundamentals BUS6670
- Introduction to Health and Medical Sciences HMS8302
- Resource Management FCS8219
- Technology Foundations DTE8403

Section 10: Elementary School Career Awareness

Section 10 describes how elementary school students may learn about work, different jobs, and the basic concepts of economics, work ethics, and career choice.

Section 10: Elementary School Career Awareness

Children begin in early education to lay a foundation for career development through rigorous courses in academics. As an example, academic courses offer information about different jobs and the basic concepts of economics, work ethics, and career choice.

Career Awareness in Elementary School
In addition, career and technical education offers three areas of instruction to elementary school students to help them prepare for future roles and responsibilities:

- **Careers and You DTE8475:** This course helps elementary school students explore a variety of careers.

- **Keyboarding Instructional Units:** These units are designed to familiarize students with basic computer operations and the elementary functions, layout, and use of the keyboard. The touch skills of entering text/data for language arts is the major goal at the elementary grades.

- **Technology Awareness DTE 8410:** Technology Education experiences in the elementary school are designed to help children learn and achieve the educational goals of the total elementary school program. These experiences orient children to technology, develop psychomotor skills, and provide the basis for informed attitudes about technology's influence on society. Technology-based activities, integrated into the total elementary school curriculum, motivate children and reinforce learning while children gain a degree of technological awareness.
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Section 11: Comments and Questions

Section 11 supplies you with a list of individuals at the Virginia Department of Education who can answer your questions regarding instructional planning.

Section 11: Comments and Questions

If you have general comments, questions, or suggestions about the content of the *CTE Administrative Planning Guide,* please call or e-mail the following:

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